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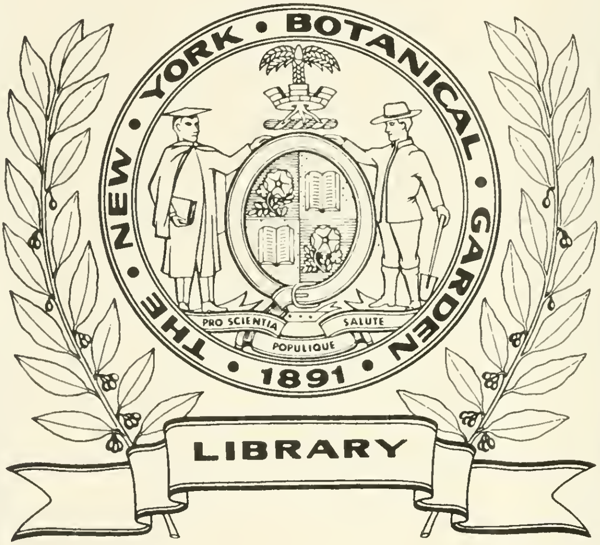
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THE

JOURNAL OF BOTANY

BRITISH AND FOREIGN.

Edited by

JAMES BRITTEN, F.L.S.,

British Museum (Natural History), South Kensington.

VOL. XXIII.

ILLUSTRATED WITH PLATES AND WOODCUTS.

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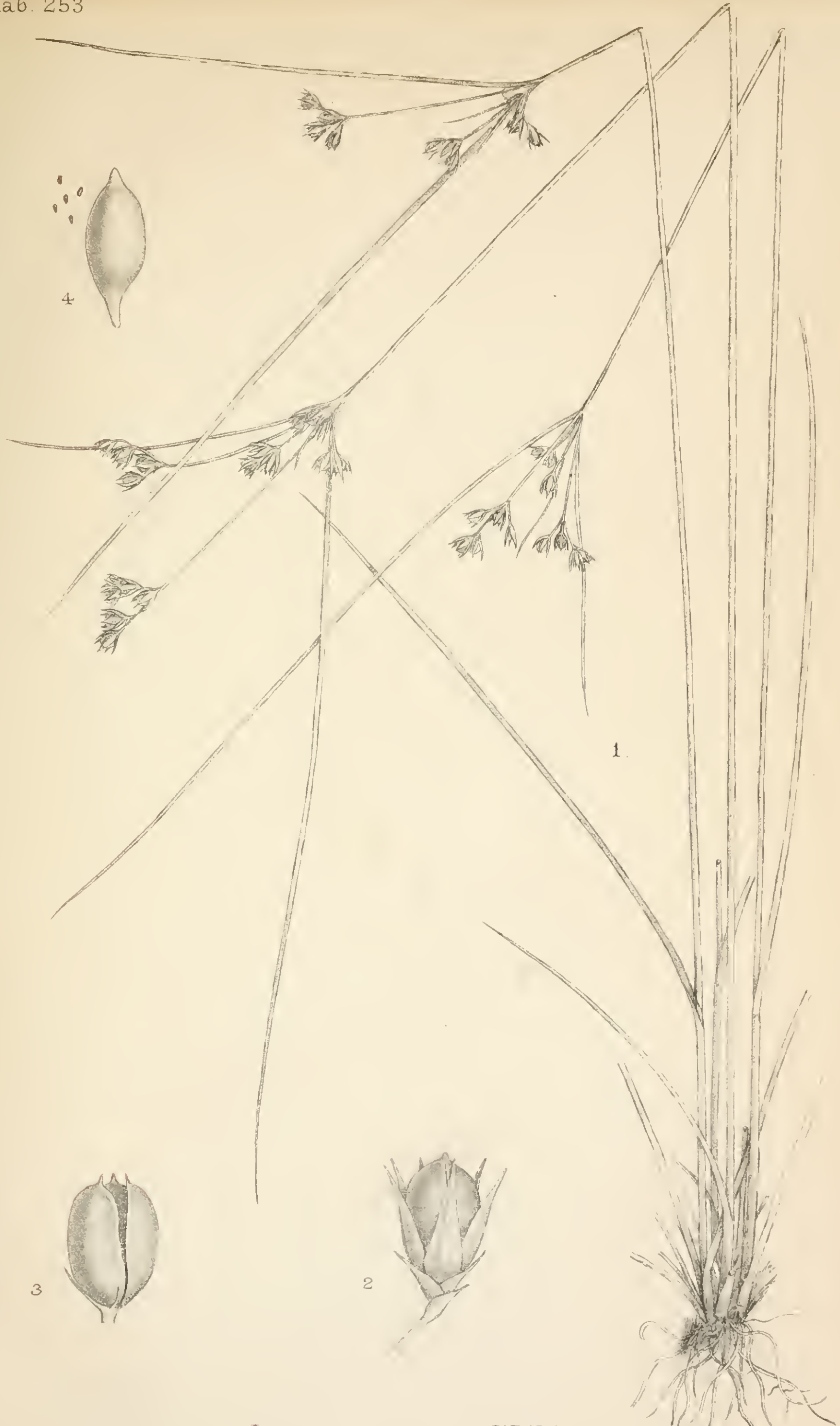

Juncus tenuis, *Willd.*

Robᵗ Morgan, del. et lith.

West, Newman & Cᵒ imp

THE

JOURNAL OF BOTANY,

BRITISH AND FOREIGN.

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ON *JUNCUS TENUIS* AS A BRITISH PLANT.

By H. N. Ridley, M.A., F.L.S.

(Tab. 253.)

The first time that we hear of this plant as a native of the British Isles is in 'English Botany,' t. 2174, published in 1816, where it is described by Sir J. E. Smith as a new species under the name of *Juncus gracilis.* Later, Smith (Engl. Flora, ii. 167) altered the name to *J. Gesneri*, as the name *J. gracilis* was previously in use. The specimens from which it was described were stated to have been collected by George Don in Forfar in 1795 or 1796, and in the mountains of Scotland by Dickson. In Gardiner's 'Flora of Forfar,' p. 183, it is recorded thus:—"By a rivulet in marshy ground among the mountains of Clova, near their summits. Mr. G. Don and Mr. D. Don."

There are two specimens of the plant in flower in a collection of Grasses, *Cyperaceæ*, and *Juncaceæ* made by George Don, preserved in the Natural History Museum, and specimens are stated by Mr. G. C. Druce ('Scottish Naturalist,' Oct., 1884, p. 264) to exist in two other collections made by Don. The plant is not localised in the British Museum collection, but in one of those seen by Mr. Druce it is labelled Clova. From that time till 1883 the plant has never been rediscovered in Britain, and has long dropped out of the botanical books, it being supposed that Don distributed the plant by mistake, having either cultivated it in his garden or obtained it from abroad, as was confessedly the case in certain of his reputed discoveries. The other plants, however, in his collection in the British Museum are natives of Britain, although some were certainly not obtained from Forfar.

AUG 7 - 1923

In this Journal for 1884, p. 91, is a note from Mr. R. F. Towndrow announcing his discovery of the plant in a rough and rushy pasture in the parish of Cradley, in Herefordshire. He found there but a single tuft. The plant was verified by Mr. Baker, and specimens were also sent to the Natural History Museum. These specimens are in flower, and, it is interesting to note, bear a great similarity to those of Don, being rather more weak and gracile than most of the continental specimens.

The distribution of the plant has several points of interest. It is common in North America, extending across the whole continent from Hudson's Bay to Mexico. In Europe it is much rarer, occurring sporadically in Holland, between Auersfort and Nykerke (*Bondam*!); in Belgium, at Aerschot (*Van Heurck*!); in Schleswig-Holstein (*Hansen* !); in France, at Nantes (*Billot* !). In Germany it seems more common, especially in Saxony: Görlitz and Rothsstein, at 1400 ft. (*Baenitz* !); Herrnhut (*Hans* !); Tharand (*Reichenbach* !); Rostan (*Martens* !); also in Swabian Bavaria, near Memmingen (*Koeberlin*!); and in Bohemia. It is also found in Madeira (*Mandon* !); in the Cape Verde Isles (*R. T. Lowe* !); and in the Azores (*Drouet* !); and near Nelson, in the North Island of New Zealand (*Cheeseman* !).

Thus it will be seen that as far as regards Europe it is strictly Western, and may be considered as a Germanic type. It appears to prefer roadsides, especially in sandy places, such as paths across heaths or through pine-forests, and to avoid high ground and wet localities, facts which seem to throw doubt upon Don's habitat, which, if genuine, would be the most northern limit of the species in Europe. It seems hardly necessary to state that there is no evidence that it is a recent introduction from North America, but possibly it may be a relic of the old land-connection with that continent, like *Eriocaulon septangulare*.

I subjoin a description of the plant, with its more important synonyms:—

Juncus tenuis Willdenow, Spec. 2, 214 (1799); Reichenbach, Ic. Flor. Germ., pl. cccxcviii., fig. 887; Sturm, 'Deutschlands Flora,' vi., 1.

J. pallidus Willdenow Herbarium, *fide* Buchenau.

J. bicornis Michaux, Flora bor. Am. 1, 191 (1803).

J. gracilis Smith, Eng. Bot., No. 2176 (1816). Bicheno, Trans. Linn. Soc. xii. 313.

J. Gesneri Smith, Engl. Flora, vol. ii., p. 167 (1828).

J. secundus Beauvois, Encycl. Meth. Bot. Supplem. iii., p. 160 (1813).

J. macer S. F. Gray, 'Natural Arrangement of British Plants,' ii., p. 164 (1821).

J. chloroticus Schultes, Roem. & Schultes, Syst. Veg., vii. i. p. 240 (1829).

J. Smithii Kunth, Enumeratio Pl., vol. iii., 349 (1841).

J. lucidus Hochstetter in Seubert, 'Flora Azorica,' p. 24 (1848).

J. Germanorum Steudel, Syn. Pl. Glum. ii. 305 (1855).

J. vacillans Steud., *l. c.*

J. compressus × *effusus* O. Kuntze, Taschen-flora von Leipzig, p. 55, 1867.

A perennial plant with very short rhizome and numerous wiry roots. Stems slender, several together in a tuft, one foot to a foot and a half in height, with narrow, flat, linear leaves, usually somewhat involute and channelled, six to nine inches long. The panicle usually loose, erect, the last stem-leaf overtopping it generally considerably; petals and sepals pale, narrowly lanceolate, acuminate, 1½ to 2 lines in length, usually slightly spreading in fruit. Stamens 6. Capsule ovate, oblong, shortly mucronate, yellowish and shining, usually shorter than the perianth. Seeds minute, with a very short apiculus at each end. It is most nearly allied to *J. Gerardi* Lois.

Description of Plate.—1. *Juncus tenuis* Willd., specimen from Germany (nat. size). 2. Ripe fruit with perianth (enlarged). 3. Capsule dehiscing (enlarged). 4. Seeds (nat. size and enlarged).

OXFORDSHIRE MOSSES.

By Henry Boswell.

The period elapsed since the publication of the list of Mosses in this Journal for 1872 (pp. 363–374) has been not altogether unproductive, rather more than a dozen additional species having been discovered; some new localities have been found for others, and a few of those only reported as barren have been obtained in fruit. In recording these I take the opportunity of making one or two corrections of the previous list, and of enumerating the *Hepaticæ* which have come under notice. These latter are not numerous; they require for the most part even a greater degree of shelter and atmospheric moisture than the mosses proper, and a drained and cultivated country is unfavourable to the growth of the majority of the species.

Mosses.

Dicranoweissia cirrhata (Hedw.) Lindb. (*Weissia*). On thatch of an old shed at Ascott-under-Wychwood, in plenty, March, 1879. The shed has subsequently been removed, and at present I know of no other Oxfordshire site for this moss, though it is comparatively frequent in the neighbouring county of Worcester, and westwards into Herefordshire. March, April.

Dicranum majus Turn. Fruits in the woods about Watlington, Stokenchurch, and Wycombe. Large but barren in Singe Wood, near Witney. June, July.

Leucobryum glaucum Hedw. Woods near Goring.

Fissidens pusillus Wils. On both earth and stones in hedgebanks near Witney and Hailey. November to February. — *F. incurvus* Sch. Tar Wood; plentiful. February, March. — *F. exilis* Hedw. Tar Wood, with the last; and at Stockley, Wychwood Forest. Winter. — *F. inconstans* Sch. Founded on my Sunningwell specimens, seems to be only a *sport* of *F. bryoides*, possessing no substantial characters. It occurred in 1880 between Witney and Burford, but I could never regard it as a good species.

Ephemerum serratum Hampe (*Phascum* Schreb.). Wychwood Forest, near Asthalleigh.

Phascum muticum Schreb. Wychwood, near the last.

· *Leptotrichum flexicaule* Hampe (*Ditrichum*). — Burford Quarries, 1873. Stonesfield, 1874, 1878.

Trichostomum luridum (*Didymodon*) Hornsch. On walls at Headington Hill and Cumnor Hill; stones near Sandford Lasher; near Witney; Asthalleigh and Ascott. — *T. tophaceum* Brid. In plentiful fruit on the new embankment by the reservoir at Heading Hill. A small form resembling *T. luridum* rather than the usual states of this plant. December. — *T. crispulum* Bruch. Holton Stone-pits, scattered among grass in single stems, not growing in tufts.

Tortula aloides Br. & Sch. Scarce about Oxford; more plentiful near Witney and Hailey. Winter. — *T. fallax* Hedw. North side of Shotover Hill above the brick-yards; near Islip, Bicester, and Witney. November. — *T. rigidula* Dicks (*Didymodon* H. & T.), *T. rigidulum β densum* Wils., Bryol. Brit., *T. neglectum* Wils. MS. Walls and stones near Witney and Asthalleigh, 1877. Wychwood Quarries and by Singe Wood, 1879. Autumn.—*T. sinuosa* (*Dicranella*) Wils. MS.; *Didymodon* Schpr., Synops. Very scarce and small near Oxford; frequent about Witney, and larger. Its favourite place seems to be the loose soil at foot of a wall, but it occurs also on stones, and on trees in watery places. Wall at Hanwell, near Banbury; sandy hedge-banks near Henley and Bagley Wood. A singular moss, unknown as yet in fruit; perhaps will prove eventually merely a depauperated state of the next. — *T. tortuosa* L. Fine but barren on stone walls at Asthalleigh, and Widford, near Burford, 1876, 1879.—*T. squarrosa* Brid. (*Pleurochæte* Lindberg). Holton Stone-pits; scattered in the same manner as *Trichostomum crispulum*, and an equally unexpected find.—*T. marginata* Br. & Sch. Great Tew, near the church; plentiful, 1874, *H. B.* Magdalen College Groves; scarce, 1884, *Rev. H. E. F. Garnsey*.—*T. latifolia* Br. & Sch. Plentiful by the Evenlode, near Ascott, but fruit scarce. Side of the Cherwell, in Christchurch Meadow, growing on stone, and barren. April.—*T. papillosa*, Wils. Rare; on trees near Witney, Oxon, and Kennington, Berks.

Zygodon viridissimus Brid. Fruit rare; Bodicote, near Banbury, *H. B.*; Watereaton, *Rev. H. E. F. Garnsey*. April.

Ulota intermedia Schpr. Wychwood Forest; Stokenchurch; Bagley Wood. To this belongs the *U. Bruchii* of my former list, and also many specimens passing as *U. crispa* and *Bruchii* in herbaria,—for instance, Mr. Croall's specimens in the 'Plants of Braemar.' It appears the most widely spread of the group, growing very much larger in the north: specimens that I gathered in Rosshire and Skye are the finest I have seen, but Mr. MacAndrew sends nearly as fine from Kirkcudbrightshire, where it grows in company with *Bruchii*, *crispa*, *crispula*, and *Drummondii*, the last two much less plentiful. July.

Orthotrichum obtusifolium Schrad. On two ash trees near Wytham Wood, 1878. Growing with *O. tenellum* and *diaphanum*.

Bryum albicans Wahl. (*Webera* Sch.). Stone wall by the Cherwell, in Christchurch Meadow; found by Mr. Garnsey. — *B. inclinatum* Br. & Sch. Fine and plentiful on the side of the railway between Witney and Bampton. Wall at Coombe. May. — *B. intermedium* W. & M. North side of Shotover Hill, 1883; scarce. October to January.—*B. erythrocarpum* Schwg. (*sanguineum* Ludw.). North side of Shotover Hill, growing with *B. turbinatum*. May, June. — *B. pallens* Swartz. North side of Shotover Hill, upon sandy ridges; fine and plentiful, 1884. July. — *B. turbinatum* Hedw. This rare species seems to have been destroyed in its old site at Bullingdon, but has lately appeared in fine state at Shotover, near the last three species, on wet sandy soil. May, June. — *B. roseum* Schreb. Singe Wood, 1880; fine, but barren.

Aulacomnion palustre. Shotover, with the next.

Philonotis fontana (*Bartramia* Brid.). North side of Shotover Hill; Eynsham Demesnes.

Pogonatum nanum. Eynsham Demesnes; fine. November.

Cryphæa heteromalla Hedw. This was accidentally omitted from the former list; it occurs occasionally upon trees, but is not very common. Bullingdon; Stokenchurch; Kirtlington; Wychwood; &c. Fine specimens at Buckland, Berks, in 1861. Spring.

Neckera complanata Hedw. Fruit in Stokenchurch Woods; and plentiful on a stone wall in Tully-bushes, Wychwood Forest. November.

Brachythecium salebrosum Hoffm. Hedge-bank between Witney and Ducklington, 1876. December. — *B. albicans* Neck. On thatched roofs about Eynsham, Witney, and Hailey; more frequent than in the immediate neighbourhood of Oxford. Winter. — *B. populeum* Hedw. Still seems very scarce; Mr. Garnsey finds it at Headington Copse. Winter.

Eurhynchium crassinervium Tayl. Near Witney; Asthalleigh; Hanwell, near Banbury. Winter.

Hypnum falcatum Brid. Still exists at Bullingdon, but under very precarious circumstances, the bog being for the most part drained and brought under a sort of cultivation. *H. Sendtneri* is quite a different thing, and allied to *revolvens*. It seems not to be found in this region, but is frequent enough in districts of a peaty and sandy character.—*H. arcuatum* Lindb. (not Hedw.); *H. pratense* Wils., Bryol. Brit. (not Koch); *H. Patientiæ* Lindb. On heavy loam, side of a ride in Coggs Wood. It seems altogether a summer moss, disappearing in winter, when most of the Hypnoid mosses flourish.

Sphagnum subsecundum Nees. Powder Hill Copse, 1874. Ramsden Heath, 1879. Coggs Wood, 1880. The small form usual on heaths.

The additional species here enumerated are sixteen in number, and raise our total to 191.

HEPATICÆ.

Alicularia scalaris Schrad (*Nardia*). Wychwood Forest, 1879. Coggs Wood, 1882.

Plagiochila asplenioides L. Damp woods and copses; frequent, and sometimes very large, but always barren. Shotover; Headington Wick Copse; Wychwood; Stokenchurch; &c. I have fruit from Gloucestershire, and it may be found in the hilly district about Stokenchurch.

Scapania undulata Dill., Nees. In a small stream at Coggs Wood. A short, broad, bright green form, very different from those found in the mountains. — *S. nemorosa* L., Nees. Shotover Hill; near Buckland, Berks. — *S. irrigua* Nees. Wet spots in Singe Wood, near Witney, January, 1880. N.B.—The figure under this name in "British Hepaticæ," published with 'Science Gossip,' is altogether misleading, and seems to have been taken from some foreign species, but I cannot find what. It is very like *Gymnanthe Wilsoni.*

Jungermannia albicans L. Shotover Hill; Stokenchurch; Wychwood; Bagley Wood.—*J. crenulata* Sm. Shotover Hill; Ramsden, Wychwood. Fruiting in March. — *J. gracillima* Sm. (*J. tenerrima* Raddi.). Damp ride in a copse near Bagley Wood, with *Pleuridium nitidum.* This seems nothing but a depauperated state of the last; and *J. Genthiana* Hueb. the same.—*J. sphærocarpa* Hook. Shotover Hill; Stokenchurch; Singe Wood; Coggs Wood; Buckland, Berks. —*J. pumila* With. Shotover Hill.—*J. bicuspidata* L. (*Cephalozia* Dumort., Spruce). Stokenchurch; Singe Wood; Wychwood Forest: and in Windsor Great Park.

Lophocolea bidentata L., Nees. Frequent in damp woods and copses; fruit occasionally abundant in spring; Shotover; Pennywell Wood, Elsfield; Gravehill Wood; &c.—*L. heterophylla* Schrad., Ness. Stockley Wood, in Wychwood Forest, 1869.

Calypogeia Trichomanis L., Nees. Shotover Hill and Plantations; Singe Wood.

Radula complanata L., Dumort. On trees, not rare; with *Neckera complanata*, *Frullania*, &c. Near Stow Wood; Yarnton; Noke; Witney; &c.

Madotheca platyphylla L., Dumort. Shady old walls, sometimes forming large patches, but barren. Shotover; Noke; Hincksey; Elsfield; &c.

Frullania dilatata L., Nees. Frequent on trunks of trees, and not rarely in fruit; Bullingdon; Yarnton; Wychwood; Nuneham, &c.

Blasia pusilla L. Shotover Hill; Headington Wick; Stokenchurch.

Pellia epiphylla L. Bullingdon; Headington Wick; Shotover Plantations; Bagley Wood.

Aneura pinguis L. Bullingdon; Headington Wick.—*A. multifida* Dum. North side of Shotover Hill, 1866. Harpsden, near Henley, 1882.

Metzgeria furcata Nees. Shotover; Stokenchurch; Yarnton; near Banbury; &c. Not infrequent.—Var. *β æruginosa.* Stokenchurch; Goring and Streatley.

Marchantia polymorpha L. Common; fruiting occasionally. A very large form at Headington Wick, growing between tussocks of *Carex paniculata*, June 1859 and 1867.

Fegatella conica Raddi (*Conocephalus* Neck.). Wet places by springs; fruit, Shotover Plantations, April, 1859, 1860. Wychwood, 1870.

Lunularia vulgaris Mich. Shotover, &c.; no fruit.

The above are all the *Hepaticæ* I have met with, but four other species are given by Sibthorp in the 'Flora Oxon.' as occurring at Shotover a century ago, viz., *Chiloscyphus polyanthus*, *Saccogyna viticulosa*, *Lepidozia setacea*, and *L. reptans*.

EUGENIAS QUATTUOR NOVAS SINENSES

OSTENDIT H. F. HANCE.

1. **Eugenia** (SYZYGIUM) **gracilenta.**—Ramis gracilibus subquadrangulatis cortice fusco obductis, foliis membranaceis ellipticis basi in petiolum bilinealem cuneatim attenuatis apice caudato-acuminatis supra parum nitentibus subtus pallidis costa tenui leviter prominula nervis pennatis inconspicuis novellis cano-sericeis adultis glaberrimis 2¼ poll. longis 10–12 lin. latis, cymis axillaribus bracteis folio homomorphis præditis laxe paucifloris di-tri-chotomis tenuibus folio brevioribus, pedicellis filiformibus 2-linealibus, calycis cano-sericei tubo campanulato longitudinaliter 4-sulcato ½ lin. longo lobis orbiculatis tubo æquilongis, petalis orbiculari-ovatis liberis expansis ciliatis albis lineam longis.

Ad Sai-chü-shan, juxta fl. North River, prov. Cantonensis, m. Dec. 1883, coll. rev. B. C. Henry. (Herb. propr. n. 22268).

Affinis *E. micranthæ* Thw. !, *Syzygio tenuifloro* Brongn. ! e Nova Caledonia, specieique ex eadem insula, n. 2627 ! a cl. Vieillard insignitæ.

Specimina cognatæ speciei *E. acuminatissimæ* Kurz ! cum exemplaribus a b. Helfer in Tenasserim lectis optime congruentibus, in ins. Hong-Kong, a. 1879, invenit cl. C. Ford.

2. **Eugenia** (SYZYGIUM) **tephrodes.**—Glaberrima, ramis ramulisque tetragonis marginatis cortice fibroso soluto pallido tectis, foliis coriaceis ovatis v. ovato-lanceolatis obtusis v. obtuse acuminatis basi cordatis utrinque opacis subtus cinereo-albidis venis subtus tantum prominulis subsessilibus 10–18 lin. longis 6–10 lin. latis, cymis ramulos terminantibus multifloris erectis 2½ poll. longis, floribus subsessilibus, calycis tubo clavato-oblongo corrugato cinereo-albido 2½ lin. longo lobis semi-orbiculatis ½ linealibus, petalis orbiculatis lineam longis calyptratim secedentibus quam stamina triplo brevioribus.

Juxta Ka-chik, ins. Hai-nan, d. 30 Nov. 1882, invenit rev. B. C. Henry. (Herb. propr. n. 22250).

Arte affinis *Syzygio pseudo-caryophyllo* Vieill. ! e Nova Caledonia; quæ reticulatione foliorum majorum, siccitate rubentium, præsertim differt.

3. **Eugenia** (SYZYGIUM) **Henryi.**—Glaberrima, cortice saturate cinereo, ramis teretibus, ramulis quadrangulatis, foliis coriaceis

elliptico-lanceolatis obtusis v. obtuse subacuminatis supra nitidis costa impressis nervis inconspicuis subtus pallentibus costa prominula venis tenuibus vix conspicuis 1½ poll. longis 5–8 lin. latis brevissime petiolatis, cymis terminalibus necnon ex axillis superioribus oriundis paucifloris, floribus brevissime pedicellatis, calycis subinfundibularis tubo minute ruguloso v. pustulato 3-lineali lobis minutis ad marginem truncatum recurvum fere reductis, petalis obovatis pellucido-punctatis calycem parum superantibus liberis, staminibus petalis longioribus a stylo superatis.

In ins Hai-nan, prope Wo-shi, d. 31 Oct. 1882, leg. rev. B. C. Henry. (Herb. propr. n. 22263).

Juxta *E. Championi* Benth. ! collocanda, quæ vero discedit foliis minoribus, distinctius venosis, calycibusque duplo minoribus basi exquisitius attenuatis.

4. **Eugenia** (Syzygium) **myrsinifolia.** — Frutex 12-pedalis, glaberrimus, ramis teretibus, ramulis compressis, foliis coriaceis oblongis obtusis basi in petiolum 2½ lin. longum subangustatis utrinque opacis subtus pallidioribus costa supra impressa subtus prominente venis pennatis subtus magis conspicuis tenuibus densiusculis vena intramarginali unitis 3-pollicaribus 7–10 lin. latis, cymis terminalibus trichotomis densis fastigiatis, pedicellis ¾ lin. longis, calycis tubo obconico 2 lin. alto margine truncato, petalis calyptratim secedentibus, genitalibus e calyce longe exsertis, bacca ovoidea 4 lin. diametro limbo calycino truncato conspicue coronata.

In territorio indigenarum ins. Hai-nan, Lai dictorum, d. 21 Nov. 1882, leg. rev. B. C. Henry. (Herb. propr. n. 22277).

Affinis *E. cuneatæ* Wall. ! sed differt foliis duplo minoribus, cymis multifloris, fastigiatis. Fructus edulis.

ON *SENECIO SPATHULÆFOLIUS* DC.

By J. G. Baker, F.R.S.

My own impression with regard to *Senecio spathulæfolius*, if I may be excused for expressing a difference from the views of two such high authorities as Professor Babington and Sir J. D. Hooker, is that the Holyhead plant is substantially the *Senecio spathulæfolius* of DeCandolle, but that it is only a variety of *S. campestris*, with the characters that Sir J. D. Hooker has assigned to it in placing it as such. Take the two plants in combination, and they extend over a geographical area reaching from Britain and Scandinavia in the north-west, through Central Europe to Spain, Italy, Croatia, Servia, and Transylvania, and crossing the Ural through the whole breadth of Siberia to Manchuria and Kamschatka. This aggregate is represented in the Kew Herbarium by two large bundles, containing specimens of upwards of fifty different gatherings from various countries through this wide area, and in attempting to sort out the *spathulæfolius* from the *campestris* I have utterly failed in drawing any clear line of demarcation between the two. The types of the two are characterised excellently in Koch's Synopsis, but between *campestris* as figured in 'English Botany' and *spathulæfolius* as figured in Reichenbach's 'Plantæ Criticæ,' fig. 240, one finds every intermediate gradation in robustness of habit, in the shape, texture and petiolation of the leaves, in the number and size of the capitula, and in the vestiture of the leaves and involucral bracts. In Britain the genuine *campestris*, so far as I have had the opportunity of seeing it, grows on the dry turf of the top of our chalk downs, associated with such plants as *Carduus acaulis*, *Gentiana campestris*, and *Amarella* and *Chlora perfoliata*. Take a Composite from a station like this and place it for once on a sea-cliff, and a great difference in size and luxuriance may reasonably be expected. I have not yet seen the Micklefell specimens, but shall be surprised if they agree with the Holyhead form.

Another point to be considered is that here, as in many other cases, making two species needlessly out of one lands us in a suppositious geographical anomaly. According to Grenier and Godron, there is no *campestris* at all in France, but all the French plant is *spathulæfolius*. But cross the Channel, and immediately on the chalk downs of Sussex and the Isle of Wight *campestris* begins, and there is no *spathulæfolius* till the whole breadth of England and Wales is crossed. Speaking from a geographical point of view, one would not care to believe in such an anomaly as this, unless there were very decided evidence in its favour. I find that in 'Topographical Botany' we made a mistake in registering both *campestris* and *spathulæfolius* from Anglesea. *Campestris* is given on the authority of Mr. John Ball, and I find on referring to his specimens in Mr. Watson's herbarium that it represents the ordinary Holyhead *maritima*. In connection with the matter reference may also be made to Prof. Babington's note in 'Loudon's Magazine of Natural History,' vol. v., p. 88, where two extreme forms of the Cambridgeshire plant are figured, and to a note at page 43 of the 'Report of the Botanical Record Club for 1883.'

Finally, Prof. Babington is mistaken in supposing that DeCandolle nowhere quotes the name "*Cineraria lanceolata*, Lam. Fl. Franc. ii. 125." He will find it duly cited in the 'Prodromus,' not in connection with *spathulæfolius*, but as a synonym of *S. campestris* β. *vulgaris*, and yet of course it refers to a plant native in France.

THE BOTANY OF THE BARROW.

By H. C. Hart, B.A.

The River Barrow takes its rise on the north side of the Slieve Bloom Mountains, in the north-west of the Queen's County. From here it runs north for a short distance, and then east to Monasterevan, on the borders of the same county. From Monasterevan the Barrow runs south, separating Kildare from Queen's County till it reaches Carlow, and subsequently it divides the latter county from Kilkenny, becoming tidal at St. Mullins. A little lower, having received the waters of the Nore, it becomes a wide estuary at New Ross. Widening farther south it receives the Suir, and helps to form the noble inlet of Waterford Harbour. From its source to its union with the Nore the Barrow is about 110 miles in length, and from Millford, in Carlow, to New Ross, in Wexford, the scenery is in many places very lovely; Graiguenamanagh and the wooded declivities along the reaches past Borris and St. Mullins are scenes of extreme beauty.

The upper half of the river, from the base of the Slieve Blooms to Athy, is an uncertain wandering through a plain where the river frequently loses itself in a swampy flat, to be converted into a shallow lake in winter—an undrained and undrainable region, rendered hopelessly so by the numerous weirs and mill-dams from Athy onwards. This part of the river is rich in marsh species—many local ones abound; and ducks and other aquatic birds breed here undisturbed in vast numbers. Numerous ruins of castles, some noble, others merely picturesque, as well as several handsomely castellated and imposing mills adorn the banks. Wooded demesnes lie along, and sometimes, as at Garryhinch, lie under the water for a considerable distance. Continually was I asked the all-important question, "Will the drainage be finished this year?" and I found it useless to attempt to deny my connection with a company said to exist for that purpose. What could a man with neither gun, rod, nor dog otherwise be up to?

For a considerable distance (from Athy to St. Mullins) there is a tow-path for canal-boats either actually on the bank of the Barrow or else a few perches from it, on the parallel canal, where the two are not in combination. I was always careful to follow that bank of the river which was *not* under this contaminating influence. This of course was entirely in opposition to the common-sense views of occasional well-wishers and would-be guides along its course, and no doubt the labour would have been greatly reduced had I accepted advice; but the natural and swampy side had undeniable claims on a botanist. I spent 5½ days on this exploration, taking another day among the bogs, and up the Black or Figile river, near Monasterevan. My travels lay chiefly in District III. of the 'Cybele Hibernica,' but in the upper part of the river I started along Districts VII. and V. To the floras of these three districts I added upwards of seventy plants. Amongst these species thus discovered in new localities are *Nasturtium sylvestre*, *Campanula Trachelium*, and *Carex axillaris*, the first two of which were previously known from a single Irish district apiece, while the latter has been authenticated from a single locality only—that of Kinsale, in Cork. Again, it was very interesting to observe the striking abundance of some very local species in Ireland, such as *Stellaria glauca*, *Glyceria aquatica*, and *Scirpus sylvaticus;* while numerous uncommon plants were found in new habitats.

The River Barrow, it may be seen, has received little attention at the hands of botanists. In the 'Cybele Hibernica,' under *Butomus umbellatus*, will be found the words, "Sent from the Barrow to Threlkeld." I was always on the look-out for this species, but without success. Again, in the Supplement to the Cybele, we find under *Glyceria aquatica*, "In the Barrow, below Carlow; R. Clayton

Browne." This species extends almost the entire length of the river. One or two other less noteworthy references occur.

I will now enumerate the species I met with, which are not recorded from their respective districts in the 'Cybele Hibernica' or its Supplement:—

District V.

Nasturtium sylvestre. Sagittaria sagittifolia. Carex vesicaria.

New localities were also found for *Chærophyllum temulum*, *Verbena officinalis*, *Stellaria glauca*, *Rumex Hydrolapathum*, *Glyceria aquatica*, *Myriophyllum verticillatum*, and other scarce plants.

District VII.

Ranunculus Lingua
Stellaria glauca
Cerastium glomeratum
Lychnis vespertina
Œnanthe fistulosa
Helosciadium inundatum
Daucus Carota
Myriophyllum verticillatum
Rosa arvensis
Pyrus Aria
Tragopogon pratense
Apargia hispida
Crepis paludosa
Campanula Trachelium
Potamogeton heterophyllus
Juncus glaucus
Scirpus sylvaticus
Carex disticha
C. vesicaria
C. acuta
C. remota
Bromus commutatus
Alopecurus geniculatus

District III.

Ranunculus pseudo-fluitans
Nasturtium amphibium
N. sylvestre
Stellaria glauca
Sagina ciliata
Lepigonum rubrum ?
Rosa tomentosa
Rubus cæsius
Pyrus Aucuparia
P. Aria
Myriophyllum verticillatum
M. spicatum
Œnanthe Phellandrium
Œ. fistulosa
Anthriscus vulgaris
Hieracium boreale
Crepis paludosa
Veronica scutellata
Rumex Hydrolapathum
Salix pentandra
S. repens
Habenaria chlorantha
Sparganium minimum
S. simplex
Lemna trisulca
Potamogeton rufescens (?)
P. perfoliatus
P. pectinatus
Scirpus sylvaticus
Carex paniculata
C. muricata
C. axillaris
C. acuta
C. fulva
C. stricta
C. binervis
C. pallescens
C. pendula
C. riparia
Bromus commutatus
Festuca arundinacea
F. myurus (?)
Milium effusum
Melica uniflora
Trisetum flavescens
Equisetum palustre
E. variegatum
E. sylvaticum
Cystopteris fragilis

Some of the foregoing have no doubt been recorded elsewhere, since the publication of the 'Cybele Hibernica,' from these districts. A list of gaps like the above shows how much remains to be done in ascertaining the distribution of our Irish plants. I will now give a running account of my exploration, so as to point out the habitats of the rarer plants.

On June 20th I made an excursion towards the Barrow from Graigavern, where I was experiencing the hospitality of some friends and relatives. Graigavern lies about three miles south-west from Monasterevan, in the Queen's County, and about two miles west of the river, which has here turned to its southern destination. In its immediate neighbourhood *Viola odorata*, *Listera ovata*, *Arum maculatum*, *Hypericum Androsæmum*, and *Viburnum Opulus* were prominent species. A couple of miles south of Graigavern, between Ballybrittas and the Barrow, is an extensive bog, which is intersected also by the Grand Canal. Here I spent some hours. The species noted were *Carduus pratensis*, *Carex pulicaris*, *C. paniculata*, *C. acuta*, *C. fulva*, *Osmunda regalis*, *Drosera rotundifolia*, *Potamogeton pusillus*, *Utricularia vulgaris*, *Sparganium minimum*, *Catabrosa aquatica*, *Ranunculus scleratus*, *Lemna trisulca*, *Eupatorium cannabinum*, *Bidens cernua*, and commoner sorts. This bog is a breeding resort for redshanks and teals, and many other aquatic birds. Towards Ballybrittas, by the "Waterfall" river, I saw *Juncus glaucus*, *Œnanthe Phellandrium*, *Alisma ranunculoides*, *Silene inflata*, and *Ophioglossum vulgatum;* and near "Allan Yorks" Bridge *Chlora perfoliata*, *Daucus Carota*, *Chelidonium majus*, and *Saponaria officinalis*. About Ballybrittas *Viburnum Opulus*, *Tragopogon pratense*, and *Euonymus europæus* are frequent. Near Graigavern *Potamogeton crispus*, *Helosciadium inundatum*, and *Orchis incarnata* occurred. These remarks apply to District III., and several of the above are additions to its flora.

On June 21st I started from Monasterevan up the River Barrow. A little above the town were *Œnanthe Phellandrium*, *Elodea canadensis*, *Sium nodiflorum*, *Nuphar lutea*, *Ranunculus pseudo-fluitans*, and the commoner pond-weeds occur. A very conspicuous plant here is a large, rather wrinkle-leaved, reddish pond-weed, which had no trace of inflorescence, but is, I believe, *P. rufescens*. The river here is about twenty yards across, deep, and sluggish. The country round is so flat that after continuous rain the floods are sometimes so extensively spread as to drown large tracts. An Englishman with utilitarian views, who visited this district recently under such circumstances, remarked with becoming superiority that, had they such sheets of water in his neighbourhood, piers, boat-houses, steamers, and considerable traffic would be the natural and immediate consequence. The plants last mentioned, with *Lychnis vespertina* by the water's edge, in shady thickets of blackthorn, and *Carex vesicaria*, *Poa aquatica*, *Viburnum Opulus*, and *Apargia hispida* are frequent on both banks, north and south, *i. e.*, District VII. and District V., for the river here divides them.

At Baylough Bridge, a couple of miles west of Monasterevan, I crossed to the north bank of the river into District VII.

Euonymus and *Viburnum* are frequent and characteristic. In heavy ditches parallel to the river *Carex acuta*, *C. stricta*, *C. disticha*, and *Myriophyllum verticillatum* are not unfrequent. *C. stricta* forms large tussocks, from which the pale flowering stems spreads out as the fronds from the crown of a shield-fern. In these wet meadows and ditches, swamps in winter, the plants noted were *Carex fulva*, which forms the main herbage, *Juncus glaucus*, *Listera ovata*, *Samolus Valerandi*, *Geum rivale*, *Œnanthe Phellandrium*, *Solanum Dulcamara*, *Nuphar lutea*, *Potamogeton pectinatus*, and *Stellaria glauca*. The latter is very local in Ireland, but it occurs in many places here and elsewhere along the Barrow. *Catabrosa aquatica* and *Botrychium Lunaria* occurred along here also, and in the stream *Nasturtium amphibium* begins to be frequent. *Bromus commutatus* also occurs. Opposite Lea Castle *Carex vesicaria* is abundant, while *Lysimachia vulgaris*, *Myosotis palustris*, *Thalictrum majus*, *Hippuris*, *Alchemilla vulgaris*, *Potamogeton pectinatus*, and *P. lucens* are frequent. Here I first met a very handsome species, *Scirpus sylvaticus*, which is very local in Ireland. Twayblade is extraordinarily abundant along the riverside banks. The Barrow here is only of ordinary beauty; Lea Castle is, however, an imposing ruin. Between it and Portarlington *Pyrus Aria*, *Crepis paludosa*, *Alnus glutinosa*, *Epilobium hirsutum*, *Alopecurus geniculatus*, *Symphytum vulgare*, and *Tragopogon pratense* are prevailing species, and those previously mentioned mostly occur again. At Portarlington I rested for lunch. By the railway banks I noted *Orchis pyramidalis*. Here for a space the river lies entirely in District III.; the county boundary and it part company for one mysterious mile. *Carex vesicaria*, *C. acuta*, *Myriophyllum verticillatum*, and *Scirpus sylvaticus* all still appear. The water-lily is all the yellow *Nuphar*. The river is here much prettier, winding amongst timber and wooded slopes. *Elodea canadensis* was noted, as well as *Valeriana officinalis* and *Alliaria officinalis*. The abundance of *Tragopogon pratense* is quite unusual. On the left bank of the river here, about a mile above Portarlington, I gathered *Campanula Trachelium*, one of the rarest Irish plants, and found elsewhere only by the Nore in Kilkenny. There was not much of it here, where it occurs a few yards from the river on steep banks amongst brambles and under trees. With it occurred *Ranunculus auricomus*. The locality is near the point marked Barrow Bank House on the map. Raspberry occurs along here, and nearer to Kilnahown Bridge *Sium angustifolia*, *Carex remota*, and *C. sylvatica*. Dogwood is also abundantly established. Here I gathered a sportive hose-in-hose *Geum rivale*, which produced a pretty effect. I was now in Garryhinch, a beautiful place, but subjected evidently to extensive inundations. Stagnant inlets and deep slime-pits abound near the water and amongst the trees, but the vegetation is most luxuriant, and here *Scirpus sylvaticus* grows in the greatest profusion with the *Lysimachia*, *Thalictrum*, and *Myriophyllum* already mentioned. Here, too, *Aquilegia vulgaris* occurs as a native. *Rosa arvensis* adorns these woods also, and a little past Garryhinch *Leontodon hispidum* is a prevalent weed. Towards Mountmellick I met *Ægopodium Poda-*

graria, *Ribes Grossularia*, *Saponaria officinalis*, *Lychnis vespertina*, *Knautia arvensis*, *Origanum vulgare*, and *Bromus commutatus* again. I found clean and comfortable accommodation at the inn at Mountmellick.

On Thursday the 22nd June I drove to the eastern base of Clarnahinch Mountains, in the Slieve Blooms, and, having crossed the famous ridge of Capard, descended to the west at the head of Glenbarrow, where the river takes its rise. I crossed this sandstone ridge at about 1600 feet, and the mountain and upland plants noted were *Habenaria chlorantha*, *Equisetum sylvaticum*, *Juncus squarrosus*, *Carex binervis*, *Narthecium Ossifragum*, *Empetrum nigrum*, *Scirpus cæspitosus*; and, by the source of river, *Antennaria dioica*. A little down I met with *Pyrus Aucuparia*, *Lycopodium Selago*, *Teucrium Scorodonia*, *Ajuga repens*, *Sarothamnus scoparius*, *Hieracium Pilosella*, *Ulex europæus*, *Carduus pratensis*, *Pinguicula vulgaris*, and *Cratægus Oxyacantha*, all above 1000 feet above sea-level. At about this height *Draba verna* and *Betula vulgaris* occurred by the river, and a little lower *Fragaria vesca* and *Aspidium aculeatum* appeared also. The upper limit of bracken (*Pteris aquilina*) was about 1051 feet, and between that and 950 feet were noticed *Viburnum Opulus*, *Fraxinus excelsior*, *Epilobium montanum*, *Corylus Avellana*, *Rosa tomentosa*, *Bunium flexuosum*, *Allium ursinum*, *Centaurea nigra*, *Scilla nutans*, *Orchis mascula*, *Quercus Robur*, *Carex ovalis*, *C. fulva*, and *Listera ovata*. Between 950 and 800 feet I noted *Briza media*, *Rubus saxatilis*, *Asperula odorata*, *Carlina vulgaris* and *Cystopteris fragilis*.

I have entered into some details here, as the subject of altitudinal range has occupied my attention much, and several of the above have not been recorded so high in Ireland elsewhere. The characteristic plants of this part of the Barrow, which occupies a wide stony bed between banks of sand and gravel, are *Aspidium aculeatum* and *Antennaria dioica*, which occur in unusual plenty. I was pleased to find also an abundant growth of *Cystopteris fragilis*; a single plant somewhere in Carlow was not sufficient to entitle a fern to a place in the flora of District III. From this headquarters, the station on the Barrow Bridge at Monasterevan, which I subsequently verified, has been no doubt derived. This latter is the only one for District V. A little lower I met with *Erigeron acris*, *Anthyllis Vulneraria*, and *Samolus Valerandi*; and here I was fairly out of the mountains. *Equisetum maximum*, *Eupatorium cannabinum*, *Gymnadenia albida*, *and Carex pallescens* occurred on the right bank a little above Tinnehinch Bridge. Here are wide gravel beds, which are frequently under water, and several plants of interest occur, as *Equisetum variegatum*, *Lycopodium selaginoides*, *Parnassia palustris*, *Ophrys apifera*, *Erythræa Centaurium*, *Chlora perfoliata*, and *Epipactis palustris*. Past the bridge, *Salix repens*, *Carex hirta*, *Juncus glaucus*, *Poa rigida*, *Festuca sciuroides*, *Arenaria serpyllifolia*, and *Draba verna* vary the ground, while *Carlina* and *Antennaria* are still abundant on the limestone gravel. The banks are enlivened along here by numbers of goldfinches; it was delightful to see this scarce and diminishing species so common. Black-headed gulls also were of common occurrence. About a mile below Tinnehinch Bridge the river becomes somewhat satisfied with its course, and flows between its banks. From the mountains to the bridge is a lake after floods. The Barrow now skirts the east edge of Monettia Bog, into which I made a slight détour. Curlew, golden plover, and gulls abounded. No plants of interest were seen, excepting *Veronica scutellata*, but I made little way owing to the depth of the bog-holes. From this point a noticeable feature is *Salix pentandra*, which is, however, a questionable native. If it be introduced, it has now spread on to old bogs and unbroken ground in many places between this and Monasterevan, and I think it is very likely wrong to challenge it. I have little doubt it is native in Donegal, Derry, and Antrim. A more interesting species was, however, gathered here; *Carex axillaris* was discovered in its second Irish locality. Mr. More, who saw my specimen, states that a salt-marsh near Kinsale is the only other habitat whence he has seen the true plant. Sir J. Hooker gives his opinion that it is probably a hybrid between *C. remota* and either *C. vulpina* or *C. muricata*. When I gathered it I took it for granted it was a hybrid between *C. remota* and *C. vulpina*, which both occurred with it. I had not previously seen the plant. In the water *Potamogeton perfoliatus* is common, and on its banks *Equisetum palustre* occurred. Some of these plants may be deemed unworthy of notice, but the botany of this part of Ireland has hardly been touched. I noted *Thrincia hirta*, as well as *Apargia hispida*, hereabouts. This river works along through a plain, above which it flows between artificial banks, which it can tear down and flood when so disposed, and which make walking a villainous torture and botany a fraud. *Viburnum Opulus* and *Salix pentandra* are the only objects of interest; the former very pretty with its discs of white standing out above the foliage. Somewhere about Two-mile Bridge I got dreadfully entangled in hawthorn thickets, and saw *Carex acuta*, which afterwards becomes frequent a little below the bridge. *Orchis Morio* is very plentiful with commoner species, and along here *Rhamnus catharticus* is very common. *Thalictrum majus* and *Scirpus sylvaticus* have their upper limit here. Adder's-tongue is remarkably common, and *Bromus commutatus* frequent. I reached Mountmellick before dusk, glad to have accomplished what I feared I should not be able to do in a day. I had now done the river as far as Monasterevan; it must be admitted in somewhat a rapid fashion, but river species have usually a lengthened extent, so that one is less likely to lose by rapidity than in other expeditions of the kind. If a species be skipped along the banks it is most probable it will give another chance lower down.

Near Monasterevan the county boundaries of Kildare, King's County, and Queen's County are most confusing, being sometimes along the Barrow, sometimes along the Figile River, and occasionally scooping cantles from each other regardless of all order and of both rivers.

On the 23rd June I made an excursion up the Black River northwards from Monasterevan. This river is, I think, larger at this point than the Barrow, and is formed of three streams. Cushina, Slate, and Figile rivers. In it I noticed *Poa aquatica*, *Ranunculus Lingua*, *Potamogeton heterophyllus*, *P. lucens* and *P. rufescens* (?), *Sagittaria sagittifolia* and *Carex vesicaria*. The Black River is here the boundary between District V. and VII. In fields near I noted *Carduus pycnocephalus*, not often seen so far from the coast. By the Grand Canal, which here complicates the geography still further, I gathered *Potamogeton densus*, *Œnanthe Phellandrium* var. *fluviatilis* (a frequent and undistinguishable form), and *Carex muricata*. By the Barrow, below Monasterevan, at Moore Abbey, *Thalictrum majus*, *Poa aquatica*, and on the bridge *Cystopteris fragilis* were observed. *Carex vesicaria*, *C. acuta*, *Lysimachia vulgaris*, *Sparganium simplex*, *Œnanthe Phellandrium*, and *Myriophyllum verticillatum* are frequent. After about two miles I gathered *Nasturtium sylvestre*, which was common in low wet meadows on the right bank. A single locality on the Suir and another on the Blackwater were its only known habitats in Ireland. It is plentiful along this part of the Barrow. *N. palustre* was also observed. *Elodea canadensis* occurs occasionally. White water-lily first appears about here, appearing to like deeper and more stagnant water than its yellow relative. *Carex stricta* occurs also, and *Rhamnus catharticus* commonly below Riverstone House. I left the river for the day at Old Fort Bridge (Dunvally on the map). Since the union of the Black River the Barrow has become a goodly stream, but its course here is through a dull county for a considerable distance.

On June 24th I kept the left bank from the Old Fort Bridge. There appeared to be two considerable tributaries on the right bank and only one on the left, but this one when I came to it was quite unnegotiable, a deep stagnant trough of mud, weeds and water, which I could neither wade, jump, nor swim. I was doubled back here to Cloney Bridge, and lost much time before I regained the Barrow. Prior to the Cloney I had noticed no new plants. *Nasturtium amphibium*, as well as the other two mentioned above were there, the *N. sylvestre* being frequent. *Festuca arundinacea* is also common. At this contumacious tributary I first saw *Rumex Hydrolapathum*, and in the extended swamp I had to cross to reach Cloney Bridge I saw it in several places. Frequently I tried this treacherous stream, but had to desist. *Carex paniculata* and *C. stricta* were large and plentiful by its edges. The place was horrible, and, judging from the multitude of redshanks and wild duck, is seldom disturbed. Having at length got back to the Barrow, the great abundance of *Poa aquatica* was noticeable. It forms a wide fringe on either side continuously, almost throughout the greater part of its course, and it appears to be highly valuable, for cattle wade out as far as they dare to browse on it. A little before Athy I met with *Stellaria glauca* again, and on ditch banks leading down to the river *Chærophyllum temulum* was gathered in two or three places. At Athy *Chenopodium Bonus-Henricus* occurs, and close by, along the towing-path below the town, *Verbena officinalis*, rare except in the south, and probably brought up by the traffic.

From this point there is usually a tow-path belonging to the

"Barrow Navigation Company" I believe, on one side or the other of the river, or along some canal close by. This objectionable and injurious construction has banished many interesting plants from its side of the Barrow, and limited my choice of walking considerably, as I was of course compelled to follow the side of the river where the path did not lie. Kind remarks were frequently addressed to me on the subject, but I paid them no attention. On excursions like this, if there is anything whatever to be gained by asking a peasant the way, it is to learn which way he considers impossible and the worst, and to choose that without a moment's hesitation. Below Athy I kept the right bank of the river in District III. *Geranium pyrenaicum* and *Stellaria glauca* were seen and most of the larger river plants already mentioned. *Myriophyllum spicatum* was noticed, and the large dock has become abundant. At Kilmoroney *Crepis paludosa* and the white *Lychnis* were the only novelties. In consequence of my delay in the morning it was dusk when I reached Maganey Bridge, and I luckily caught a train to Carlow, where I slept that night.

On the 25th I drove out to Maganey. Between Carlow and Maganey I noted *Orchis pyramidalis*, *Geranium pyrenaicum*, *Viola odorata*, *Lithospermum arvense*, and *Chærophyllum temulum*. From Maganey Bridge to Carlow *Carex acuta*, *C. vesicaria*, *Thalictrum*, *Poa*, *Lysimachia*, *Rumex*, and *Myriophyllum* of the large river kinds, all occurred to Carlow. *Sagittaria* was seen in one place, and by Mark's Grange, *Polygonum Bistorta* is a common weed in an old meadow, with *Orchis pyramidalis* and *Chlora perfoliata*. About halfway between Maganey and Carlow I left Queen's County, and the Barrow lies entirely in Carlow and District III. At Shrule Castle I noticed *Carex muricata* for the second time. Near Knockleg *Stellaria glauca* is common in a rushy field, and *Nasturtium amphibium* occurred again; it had been absent for many miles. *Potamogeton perfoliatus* and *P. heterophyllus* are common. Back to lunch at Carlow in afternoon. I noticed *Avena flavescens* close to the town. After Carlow I saw *Sagittaria* once more, and near Milford *Stellaria glauca*, *Carex acuta*, and the large *Rumex*. At Milford the Barrow begins to grow pretty, and its beauty here is much enhanced by the picturesque situation of some handsome mills amongst timber, by a lovely bridge with three high semicircular arches. On the bridge I noticed *Sagina ciliata*. There I crossed to the left bank to avoid the tow-path, and found in thickets *Lycopus europæus*. A little farther down was a wonderful display of yellow Iris in full flower. It formed an inland belt of about fifty yards for more than half a mile parallel to the river; outside it an abundant growth of *Caltha palustris*, at the water's edge and out as far as shallow *Poa aquatica*, and in the deep water *Potamogeton heterophyllus* and *Sparganium minimum* form the predominant vegetation. About two and a half miles below Milford, on hedge-banks down the Barrow, I gathered *Chærophyllum temulum* again, and in plenty about three-quarters of a mile from Leighlin Bridge. *Œnanthe Phellandrium* is always frequent. At Leighlin Bridge *Senebiera didyma*, *Sambucus*

Ebulus, and *Anthriscus vulgaris* occurred. A little below, a rare grass, *Festuca loliacea*, was met with in rich meadows near the water's edge, on the right bank: it is a form of *F. pratensis*. Along here the river is lovely, winding along in bold sweeps in a richly wooded country. About a mile above Bagenals-town, where I stopped for the night, I gathered *Stellaria glauca* again, and opposite the village the great water dock (*Rumex Hydrolapathum*).

On the 26th I followed the river by the right bank from Bagenalstown to New Ross. A little way past Bagenals-town *Chærophyllum temulum* is abundant below the bridge. *Lysimachia vulgaris*, *Poa aquatica*, *Carex acuta*, *C. paludosa*, *Myriophyllum verticillatum*, and the *Stellaria* and *Rumex* above mentioned occurred to Gores Bridge. Between Gores Bridge and Ballytegelea Bridge *Thalictrum majus*, *Malva moschata*, *Euonymus europæus*, may be mentioned, and past the bridge *Nasturtium amphibium* and *N. sylvestre* were seen again. Here I passed through Borris demesne, still keeping the right bank. In the woods by the water's edge the interesting species were *Crepis paludosa*, *Œnanthe crocata*, and *Milium effusum*. In these woods were a number of jays, which are scarce birds in Ireland. A little below Borris I gathered in a thicket *Carex lævigata*, *Habenaria chlorantha; Carex fulva* and *Rumex* and *Stellaria* still occur. *Thalictrum majus* also turned up again, and here for the first time along the Barrow *Scrophularia aquatica* appeared. At Graiguenamanagh, on the river wall on the right bank, *Hieracium sabaudum* grows. Here I rested for afternoon tea, and following the same bank I came in for some very severe work, especially along the wooded cliffs opposite St. Mullins. The tide reaches as far as St. Mullins and some species speedily disappear or keep well above the bed of the stream, In the water, however, *Œnanthe Phellandrium*, *Alisma Plantago*, and *Poa aquatica* still hold their own. *Œnanthe crocata* becomes more abundant, as does also *Elodea canadensis*, since the water is more stagnant. The first salt-marsh plant to appear is *Scirpus maritimus*. Lower down *Carex riparia* is very abundant. In the thicket opposite St. Mullins *Carex pendula* and *Milium effusum* both grow, the former beautiful species being very thinly distributed in Ireland. The later part of this days' work was done in the dusk, and somewhere about Carranvor I had to leave the river and got completely bewildered as to my whereabouts, so that I have little to say about the vegetation of the lower reaches, which are of the nature of an estuary. Just here the Nore flows in, and at New Ross the two streams in union form a glorious prospect. Near New Ross I observed *Echium vulgare*, *Dipsacus sylvestris*, and *Scrophularia aquatica*, along the road to Waterford. The remainder of this herborization belongs to my report on the Cummeragh Mountains.

A SYNOPSIS OF THE GENUS *SELAGINELLA.*

By J. G. Baker, F.R.S., &c.

(Continued from vol. xxii., p. 377).

197. S. cuspidata Link Fil. Hort. Berol. 158.—*S. incana* Spring Mon. ii. 157. — *S. densifolia, pallescens,* and *reticulata* Klotzsch. — *Lycopodium cuspidatum* Link.—*L. pallescens* Presl. — Stems densely tufted, about half a foot long, branched nearly or quite from the base, the primary branching pinnate, the short rhomboid pinnæ copiously compound with contiguous branchlets. Leaves of the lower plane crowded, ascending, oblique ovate, cuspidate, dilated and ciliated on the upper side at the base, ½–1 lin. long, pale green, white-edged, rigid in texture; leaves of the upper plane nearly as long, oblique ovate, cuspidate. Spikes square, ¼–½ in. long, ¾ lin. diam.; bracts ovate cuspidate, strongly keeled.

Var. *elongata* Spring Mon. ii. 67. — *S. sulcangula* Spring Mon. ii. 163.—*Lycopodium cordifolium* Hort. — Stems reaching a foot or more in length, simple in the lower part, the primary branches more elongated and more pinnate.

Hab. Cuba, Mexico, Guatemala, Venezuela, and New Granada. *S. incana* Spring differs from the type by its less crowded, less distinctly cuspidate leaves. A common species in cultivation.

Series IV.—Sarmentosæ.

198. S. picta A. Br.—*Lycopodium pictum* Griff. — Stems flexuose, sarmentose, suberect, 1–2 ft. long, regularly bipinnate; pinnæ oblong-lanceolate, caudate, ascending, ½ ft. long, the erecto-patent contiguous branchlets always simple, 1–2 in. long. Leaves of the lower plane crowded, oblong-lanceolate, falcate, pointed at the upper corner, bright green, moderately firm in texture, 1-5th to 1-4th in. long, obscurely petioled, not ciliated, cuneate on the upper, rounded on the lower side at the base, not at all imbricated over the stem; leaves of the upper plane one-third as long, oblique oblong, minutely cuspidate, white in the upper half. Spikes square, terminal on the branchlets, ¼–½ in. long, ¾ lin. diam.; bracts ovate cuspidate, acutely keeled.

Hab. Mishme and Patkaye Hills, East Himalayas, *Griffith*!

199. S. Wallichii Spring Mon. ii. 143. — *S. stipulata* Spring Mon. ii. 144. — *S. Gaudichaudiana* Spring. Mon. ii. 149. — *S. cyatheoides, canaliculata,* and *amboinensis* Spring. — *S. velutina* Cesati. — *Lycopodium Wallichii* Hook. & Grev. — *L. mimosoides* Roxb.—*L. elegans* Wall.—*L. stipulatum* Blume.—Stems sarmentose, suberect, 2–3 ft. long; pinnæ lanceolate, 6–9 in. long, the invariably simple crowded erecto-patent pinnules 1–1½ in. long, the end one sometimes 3–4 in. Leaves of the lower plane crowded, oblong-lanceolate, slightly falcate, pointed at the upper corner, equal-sided, the lower ones of the pinnules 1-8th to 1-12th in. long, the upper growing gradually smaller, dark bright green, firm in texture, obscurely petiolulate, not ciliated, truncate or slightly cordate on both sides at the base, not at all imbricated over the

stem; leaves of the upper plane one-quarter as long, oblique oblong, shortly cuspidate, much imbricated. Spikes square, terminal on the pinnules, $\frac{1}{2}$–1 in. long, 1 lin. diam.; bracts ovate cuspidate, strongly keeled.

Hab. East Himalayas, Malay Peninsula, Philippines, Malay Islands, and New Guinea. Common in cultivation, and one of the most ornamental of all the garden species.

0 200. S. Lobbii Moore. — Stems suberect, sarmentose, reaching a length of 3–4 ft.; pinnæ regular, lanceolate-deltoid, about half a foot long. cuneate at the base, the pinnules contiguous, erecto-patent, the upper ones simple, the lower forked. Leaves of the lower plane contiguous, oblong-lanceolate, falcate, acute, $\frac{1}{8}$ in. long on the pinnules, 1-6th to 1-5th in. on the pinnæ, bright green, moderately firm in texture, truncate and rather dilated on both sides at the base, not imbricated over the stem; leaves of the upper plane one-third as long, oblique ovate, cuspidate. Spikes square, terminal on the branchlets, $\frac{1}{4}$–$\frac{3}{4}$ in. long, $\frac{3}{4}$ lin. diam.; bracts ovate cuspidate, strongly keeled.

Hab. Borneo, *Lobb*! West Sumatra, *Beccari* 578! Rare in cultivation.

201. S. Victoriæ Moore in Gard. Chron. 1879, 74. — *S. atroviridis* Bracken., non Spring.—Stems suberect, sarmentose, 3–4 ft. long; pinnæ lanceolate-deltoid, usually 6–9 in, long, caudate, the upper pinnules erecto-patent and simple, contiguous, the lower forked or slightly pinnate. Leaves of the lower plane crowded, oblong-lanceolate, falcate, acute, 1-12th in. long, dark bright green, firm in texture, equal-sided, obscurely petioled, truncate on both sides at the base, not ciliated, not imbricated over the stem; leaves of the upper plane one-quarter as long, oblique oblong, shortly cuspidate, much imbricated. Spikes square, 1–2 in. long, $\frac{3}{4}$–1 lin. diam.; bracts ovate cuspidate, acutely keeled.

Hab. Borneo, *Low*! Gillolo, *C. Smith*! San Cristoval, *J. G. Veitch*! Fiji, *Brackenridge*! *Daemel* 186! *Milne* 201. Intermediate between *Wallichii* and *canaliculata*, but nearer the former. Rare in cultivation.

202. **S. megastachya**, n. sp. — Stems suberect, sarmentose, 2–3 ft. long; pinnæ ascending, oblong-lanceolate, caudate, 6–9 in. long, the distant ascending pinnules with a few distant ascending tertiary branchlets. Leaves of the lower plane nearly contiguous on the branchlets, oblong-lanceolate, very falcate, acute, 1-12th to 1-8th in. long, bright green, moderately firm in texture, equal-sided, not ciliated, truncate on both sides at the base, not at all imbricated over the stem; leaves of the upper plane one-quarter as long, oblique oblong, acute, not cuspidate. Spikes $\frac{1}{2}$–1 in. long, square, 1-12th to 1-8th in. diam.; bracts ovate cuspidate, stramineous, $\frac{1}{8}$ in. long, acutely keeled.

Hab. New Caledonia, in damp woods at Balade and Wagap, *Vieillard*! A near ally of *S. Victoriæ*.

203. S. inæqualifolia Spring Mon. ii. 148. — *Lycopodium inæqualifolium* Hook. & Grev. — Stems suberect, sarmentose, reaching a length of 3–4 ft.; pinnæ oblong-lanceolate, about $\frac{1}{2}$ ft.

long, the erecto-patent branchlets considerably compound with ascending contiguous tertiary divisions. Leaves of the lower plane contiguous, oblong-rhomboid, subacute, those of the branches $\frac{1}{6}$ in., of the branchlets 1-12th to 1-8th in. long, bright green, moderately firm in texture, not ciliated, dilated and rounded on the upper side at the base, not at all imbricated over the stem; leaves of the upper plane one-half as long, oblique ovate-lanceolate, shortly cuspidate. Spikes square, $\frac{1}{4}$–$\frac{1}{2}$ in. long, $\frac{3}{4}$ lin. diam.; bracts ovate cuspidate, strongly keeled.

Var. *S. perelegans* Moore. — *S. bellula* Moore in Gard. Chron. 1879, 173, fig. 25, non Cesati. — Stems dwarfy, not more than a foot long; pinnæ shorter, more deltoid, with more compound lower branches. Spikes copious, often an inch long.

Hab. East Himalayas, and mountains of Birma and Peninsular India. Spring's Javan plant must, I think, be referred to *S. canaliculata*. A frequent species in cultivation, but scarcely more than a variety of *S. canaliculata* in a broad sense.

204. S. CANALICULATA Baker. — *S. caudata* Spring Mon. ii. 139. — *S. Pouzolziana* Spring Mon. ii. 142. — *S. Durvillei* A. Br.; Kuhn Fil. Nov. Hebrid. 17. — *S. conferta* Moore. — *S. muricata* Cesati. — *S. sinensis* Hort. — *Lycopodium canaliculatum* Linn. (Dill. Musc. tab. 65, fig. 6). — *L. Durvillei* Bory Voy. Coquille Crypt. t. 25.—*L. caudatum*, *planum*, and *nemorum* Desv.—Stems suberect, sarmentose, reaching a length of 3–4 ft.; pinnæ deltoid, usually 4–6 in. long, sometimes flexuose and more elongated; lower branchlets copiously compound, the tertiary divisions more erecto-patent and not so close as *inæqualifolia*. Leaves of the lower plane crowded, oblong-rhomboid, pointed at the upper corner, 1-12th to 1-8th in. long on the branchlets, bright green, moderately firm in texture, not ciliated, cuneate-truncate on the upper, nearly square on the lower side at the base, not at all imbricated over the stem; leaves of the upper plane ovate-lanceolate, acute, one-half as long. Spikes square, $\frac{1}{4}$–1 in. long, $\frac{1}{2}$ lin. diam.; bracts ovate cuspidate, strongly keeled.

Hab. East Himalayas, Birma, South China, Philippines, Malay and Polynesian Islands. Rare in cultivation.

205. **S. aneitense**, n. sp. — Suberect, with the habit of *S. canaliculata*, but much dwarfer; pinnæ patent, deltoid, 2–3 in. long and broad, cuneate at the base, the lower pinnules with slightly compound tertiary segments, the divisions of all grades erecto-patent. Leaves of the lower plane spaced even on the branchlets, ascending, ovate-lanceolate, acute, a line long on the main branches, much smaller on the ultimate segments, bright green, firm in texture, not ciliated, dilated and rounded on the upper side at the base, not imbricated over the stem; leaves of the upper plane nearly as long, oblique lanceolate, acute, not cuspidate. Spikes square, $\frac{1}{4}$–$\frac{1}{2}$ in. long, $\frac{1}{2}$ lin. diam.; bracts ovate cuspidate, strongly keeled.

Hab. Aneitum, *Dr. Turnbull*! A very distinct plant, most like *S. canaliculata* on a smaller scale.

206. **S. Hookeri**, n. sp.—Habit of *S. inæqualifolia* and *canalicu-*

lata; pinnæ deltoid, ½–1 ft. long, each with several regularly pinnate lanceolate acuminate pinnules with as many as 20 erecto-patent contiguous simple tertiary segments, the longest reaching an inch in length on each side. Leaves of the lower plane crowded, rather ascending, oblong-lanceolate, subacute, bright green, moderately firm in texture, 1-12th to 1-8th in. long. obscurely petioled, rounded on both sides at the base, more so on the lower, not ciliated, not imbricated over the stem; leaves of the upper plane very small, obtuse, with a distinct cusp. Spikes square, terminal on the tertiary divisions, ¼–½ in. long, 1 lin. diam.; bracts ovate-cuspidate, strongly keeled.

Hab. Khasia Mountains, *Hook. fil. & Thomson*!

207. S. VIRIDANGULA Spring in Plant. Herb. Vanheurck. i. 29. —Stems suberect, sarmentose, 3–4 ft. long; pinnæ deltoid, reaching a foot in length, erecto-patent, the pinnules with simple upper and compound lower erecto-patent tertiary divisions, the ultimate segments usually ½–1 in. long, the branches bright green at the base. Leaves of the lower plane contiguous or nearly so on the branchlets, lanceolate, falcate, acute, 1-8th to 1-5th in. long (¼ in. long and much spaced on the pinnæ), bright green, moderately firm in texture, not ciliated, truncate at the base, dilated, especially on the lower side, not at all imbricated over the stem; leaves of the upper plane very small, oblong, with a distinct cusp. Spikes square, 1–2 in. long, 1 lin. diam.; bracts ovate-lanceolate, strongly keeled.

Hab. Mountain forests of Fiji, *Seemann* 707 *bis*, *Daemel* 187! *Milne* 196! 545!

208. S. CHILENSIS Spring Mon. ii. 141. — *Lycopodium chilense* Willd.—Stems sarmentose, suberect, 2–3 ft. long; pinnæ lanceolate or lanceolate-deltoid, 3–6 in. long, the lower pinnules with 8–10 tertiary branchlets. Leaves of the lower plane contiguous, oblong-lanceolate, cute, equal-sided, not ciliated, auricled on the upper side at the base, cut away on the lower side; leaves of the upper plane one-third as long, oblong-lanceolate, very falcate. Spikes square, ½ in. long; bracts ovate cuspidate.

Hab. Mexico, Peru, and Chili. May be conspecific with *S. canaliculata.*

209. S. SCANDENS, Spring Mon. ii. 192. — *Lycopodium scandens* Swartz; Kunze Farrn. t. 10.—*Stachygynandrum scandens* P. Beauv. Fl. Owar. t. 7. — Stems slender, pale straw-coloured, polished, climbing indefinitely; penultimate divisions lanceolate, with a flexuose axis, and spreading or ascending parallel-spaced simple ultimate divisions ½–1 in. long. Leaves of the lower plane contiguous on the ultimate branchlets, spreading, lanceolate, acute, ⅛ in. long, blue-green, rather thin in texture, slightly dilated on the upper side at the base, hardly at all imbricated over the stem; leaves of the upper plane very small, oblong-lanceolate, cuspidate. Spikes square, ½–1 in. long; bracts ovate-lanceolate, strongly keeled.

Hab. West Tropical Africa, from Senegambia southward along the coast to the Equator.

210. S. WILLDENOVII Baker in Gard. Chron. 1867, 950. — *S.*

lævigata Spring Mon. ii. 137. — *Lycopodium lævigatum* Willd., non Lam. — *L. Willdenovii* Desv.; Hook. & Grev. Ic. Fil. t. 57. — *L. pellucidum* Desv. — *L. bicolor* and *cæsium-arboreum* Hort. — Stems climbing to a length of 12–20 ft. or more; pinnæ spreading, deltoid, reaching a length of 1–2 ft., the pinnules deltoid and decompound, the ultimate branchlets short and contiguous. Leaves of the lower plane crowded, ascending, ovate or oblong, 1-12th to 1-8th in. long, green with a tint of blue, moderately firm in texture, not ciliated, obscurely petioled, cordate on both sides at the base, not imbricated over the stem; leaves of the upper plane one-third as long, oblique oblong, acute, not cuspidate. Spikes square, ½–1 in. long, ¾ lin. diam.; bracts suborbicular, with a short cusp, scarcely larger than the sporangia.

Hab. East Himalayas, Philippines, Cochin China, Malay Peninsula and Isles. Well known in cultivation. I have not seen the Brazilian plant referred here by Spring; his African locality refers to *S. scandens*.

211. S. EXALTATA Spring Mon. ii. 145. — *Lycopodium exaltatum* Kunze. — Stems climbing to a length of 50–60 ft.; pinnæ deltoid, reaching a length of 3–4 ft.; pinnules lanceolate, with numerous erecto-patent simple parallel tertiary branchlets seldom above an inch long. Leaves of the lower plane contiguous, oblong-lanceolate, falcate, acute, 1-12th to 1-8th in. long, bright green, moderately firm in texture, nearly equal-sided, not ciliated, nearly truncate at the base, not imbricated over the stem; leaves of the upper plane very small, oblique oblong, shortly cuspidate. Spikes square, ½–1 in. long, ¾ lin. diam.; bracts broad ovate, little longer than the sporangia, strongly keeled.

Hab. Forests of Tropical America from Panama to Peru.

212. **S. usta** Vieill., n. sp.—Stems 9–12 in. long, erect, simple at the base, compound in the upper three-quarters, the branches erecto-patent, the lower simple or little compound, the upper short, rhomboid, copiously compound. Leaves of the lower plane crowded, erecto-patent, ovate or oblong, subacute, ½ lin. long, bright green, rigid, dilated, cordate, serrulate, and imbricated over the stem on the upper side at the base; leaves of the upper plane one-third as long, oblique oblong, acute, much imbricated. Spikes square, ¼–½ in. long, ½ lin. diam.; bracts ovate-cuspidate, acutely keeled.

Hab. New Caledonia, on mountains near Wagap, *Vieillard*! *Pancher*!

213. S. ARBUSCULA Spring Mon. ii. 283.—*Lycopodium Arbuscula* Kaulf.—Stems 4–6 in. long, erect, simple in the lower third or half, decompound upwards, with deltoid crowded ascending branches, the ultimate branching midway between pinnate and flabellate. Leaves of the lower plane crowded, ascending, ovate-rhomboid, subacute, ½ lin. long, bright green, firm in texture, rather produced, broadly rounded, denticulate, and imbricated over the stem on the upper side at the base; leaves of the lower plane one-third as long, oblique ovate, acute, much imbricated. Spikes short, square, ½ lin. diam.; bracts ovate-cuspidate, sharply keeled.

Hab. Mountains of the Sandwich Islands, 1000–5000 feet.

214. S. CAULESCENS Spring Mon. ii. 158. — *S. peltata* Presl. — *S, bellula* and *minutifolia* Cesati. — *Lycopodium caulescens* Wall. — *L. fruticulosum* Blume, non Bory. — Stem generally ½–1 ft. long, stiffly erect, unbranched in the lower half, with spaced adpressed leaves, deltoid and decompound in the upper half; pinnæ close, deltoid, with copiously subflabellately compound lower pinnules, with contiguous ascending final branchlets ¼–1 in. long, ⅛ in. broad, liable to curl up in drought. Leaves of the lower plane crowded, ovate, fálcate, acute, ½–1 lin. long, bright green, firm in texture, rather unequal-sided, broadly rounded and shortly ciliated on the upper side at the base, and slightly imbricated over the stem; leaves of the upper plane one-third to one-fourth as long, oblique ovate, cuspidate, much imbricated. Spikes square, ¼–½ in. long, ½ lin. diam.; bracts ovate-cuspidate.

Var. *S. japonica* Macnab in Trans. Bot. Soc. Edinb. ix. 8.— Pinnæ less crowded, and not so decompound. Leaves of the lower plane broad ovate, those of the main stem and pinnæ nearly as broad as long, those of the unbranched part of the stem rather spreading.

Var. *S. argentea* Spring Mon. ii. 154.—*Lycopodium argenteum* Wall. — Larger and more compound, the banded portion often a foot long. Leaves of the lower plane thinner in texture, ovate-lanceolate, bright green on the upper surface, whitish green beneath.

Var. *brachypoda* Baker.—Unbranched portion of the stem very short; pinnæ less compound than in the type; leaves rather larger.

Hab. The type, Japan, China, East Indies (ascending to 6000 ft. in Kumaon), Ceylon, Malay Peninsula and Isles, Philippines, and New Guinea. Var. *japonica*, Japan. Var. *argentea*, Malay Peninsula. Var. *brachypoda*, Java.

215. **S. Whitmeei,** n. sp. — Stems stiffly erect, ½–1 ft. long, decompound and oblong or deltoid in the upper half, the erecto-patent pinnæ with spaced erecto-patent simple and compound lower pinnules, the ultimate branchlets 1–1½ in. long, ⅙ in. diam.; Leaves of the lower plane crowded, ascending, broad ovate, acute, ½–1 lin. long, bright green, rigid in texture, very unequal-sided, dilated, broadly rounded and much imbricated over the stem on the upper side at the base, not ciliated; leaves of the upper plane one-half to one-third as long, oblique oblong, acute, much imbricated. Spikes short, square, ¾ lin. diam.; bracts ovate-lanceolate, strongly keeled.

Hab. Mountains of Samoa, *Whitmee* 177! 221!

216. S. PENNULA Spring Mon. ii. 160.—*S. quadrangula* Presl.— *S. Presliana* Spring. — *Lycopodium Pennula* Desv. — Stems stiffly erect, 1–2 ft. long, simple in the lower half, deltoid and decompound in the upper half, the lower pinnæ deltoid, 3–4-pinnate, reaching a length of half a foot, the contiguous final branchlets not more than ¼–⅓ in. long, ½–¾ lin. broad. Leaves of the lower plane crowded, erecto-patent, oblong-lanceolate, acute, of the branchlets ½ lin. long, of the pinnæ 1 lin., dark green, moderately firm in texture,

nearly equal-sided, rounded, obscurely ciliated and a little imbricated over the stem on the upper side at the base, but not entirely hiding it; leaves of the upper plane one-third as long, oblique oblong, acute, much imbricated. Spikes short, copious, square, $\frac{1}{2}$ lin. diam.; bracts ovate, cuspidate.

Hab. Philippines, *Cuming* 2000! and, according to Spring, gathered in the Neilgherries by Perrottet. Midway between *caulescens* and *flabellata* in general habit, but more compound than either of them.

217. S. PTERYPHYLLOS Spring Mon. ii. 162. — *S. myosuroides* Presl. — Stem erect, about a foot long, simple in the lower half, deltoid and decompound in the upper half, the lower pinnæ deltoid, the ultimate branchlets not more than $\frac{1}{3}$ in. long, $\frac{1}{2}$ lin. diam. Leaves of the lower plane oblong-lanceolate, erecto-patent, $\frac{1}{2}$–1 lin. long, acute, contiguous only on the ultimate branchlets, dark green, moderately firm in texture, narrowed from the middle to the base, nearly equal-sided, hardly at all imbricated over the back of the stem; leaves of the upper plane one-third as long, oblong, shortly cuspidate. Spikes short, square, $\frac{1}{2}$ lin. diam.; bracts ovate-cuspidate, strongly keeled.

Hab. Philippines, *Cuming* 2017! Perhaps not more than a variety of *S. Pennula*.

218. S. BRAUNII Baker in Gard. Chron. 1867, 1120. — *S. pubescens* A. Br., non Spring. — Stems 1–1$\frac{1}{2}$ ft. long, erect, pale stramineous, simple in the lower half, decompound, deltoid and flexuose in the upper half, the pinnæ erecto-patent and deltoid, the pinnules regular, short, deltoid, spaced, the ultimate branchlets not more than $\frac{1}{8}$–$\frac{1}{4}$ in. long, 1 line broad. Leaves of the lower plane contiguous only on the final branchlets, nearly spreading, ovate-rhomboid, subobtuse, $\frac{1}{2}$ lin. long, liable to be revolute at both edges, dark green, moderately firm in texture, narrowed to a truncate base, not imbricated over the back of the pubescent branches; leaves of the upper plane one-third to one-half as long, oblique oblong, shortly cuspidate. Spikes short, square, $\frac{1}{2}$ lin. diam.; bracts suborbicular, cuspidate, little longer than the sporangia.

Hab. West China, *Blakiston*! A distinctly marked species, well known in cultivation.

219. S. GRIFFITHII Spring Mon. ii. 151.—*S. virescens* Spring.—*S. brevipes* A. Br.— Stems erect, $\frac{1}{2}$–1 ft. long, simple in the lower part, deltoid and decompound upwards, the root-fibres sometimes extending upwards to where the branching begins, the face bisulcate, the lower pinnæ deltoid, 3-pinnate, the branching of all grades pinnate, the ascending contiguous final branchlets $\frac{1}{4}$–$\frac{1}{2}$ in. long, $\frac{1}{8}$ in. broad. Leaves of the lower plane contiguous, more or less ascending, oblong-rhomboid, subacute, $\frac{1}{8}$–$\frac{1}{6}$ in. long, thinner in texture than in *flabellata*, spuriously 3-nerved, dilated, rounded, serrulate, and imbricated over the stem on the upper side at the base; leaves of the upper plane minute, obovate, with a large cusp. Spikes square, $\frac{1}{4}$–$\frac{1}{2}$ in. long, $\frac{1}{2}$ lin. diam.; bracts ovate-cuspidate, strongly keeled.

Hab. Mountains of Mergui, *Griffith*!

(To be continued.)

SHORT NOTES.

A New Sparganium.—In October, 1883, I observed at Albury Ponds, near Guildford, a *Sparganium* resembling *S. ramosum* Huds. in habit, but differing from it in the partially mature fruits which were all that the very depauperate specimens afforded. This led to investigation during the past year, with the result that I find the plant, which I propose to call *S. neglectum*, plentiful in various parts of Surrey. The chief distinctive characters are found in the fruit, which is somewhat obovate-acuminate, with a long beak, instead of, as in *ramosum*, obversely conical, with a very truncate (or sometimes rounded) apex and short beak. Reichenbach's plate (Icon. Fl. Ger. 751) of *S. erectum* would seem to have been drawn from the present plant rather than from *S. ramosum* Huds., which, however, is given as a synonym; and in Leighton's 'Flora of Shropshire' the fruit of *neglectum* is described as that of *ramosum*, suggesting that the former may be the common form in that county. I am, however, unable to find that the plants have ever been separated. In Surrey *S. neglectum* occurs in the basins of the Rivers Blackwater, Wey, Mole, and Arun; it thins out, however, towards the east, and I have not observed it in the Medway basin; also Mr. Alfred Fryer sends various gatherings of good *ramosum* from the fens of Hunts and Cambs., but after "exploring many miles of *Sparganium*-filled ditches," is unable to find the subject of this note, which may therefore possibly prove absent from some of the eastern counties. It is almost certain to be found in Sussex and Hants (and doubtless elsewhere), as it occurs close to the borders of the counties named, by streams flowing into them from Surrey.—W. H. Beeby.

New Records for Northumberland.—*Fumaria confusa* Sond., in company with *F. densiflora* DC., in sandy fields on Holy Island.—*Viola Curtisii* Forst. A few plants, but unmistakably the same as Lancashire specimens in my herbarium; south end of Ross Links.—*Silene inflata* Sm., *β. puberula.* Holy Island.—*Arenaria serpyllifolia* L. A stout glandular form, agreeing as far as book description goes with *A. Lloydii.* Bamborough Links.—*Radiola Millegrana* Sm. Ross Links; abundantly. Not reported in Baker's Flora, but known elsewhere in Northumberland to local botanists.—*Althæa officinalis* L. Probably introduced. Wayside near Fleetham.—*Melilotus arvensis* Wallr. Rubbish-heaps near Embleton.—*Mentha gentilis* L. By the mill-pond at Easington. Belford.—*Centunculus minimus* L. Ross Links; abundantly in one or two places. Has not yet been recorded in either of the two northern counties. — *Corallorhiza innata* Br. Several hundred plants, very vigorous, in a boggy wood on the borders of Cheviotland. I purposely refrain from specifying the locality more particularly.—H. E. Fox.

Myosotis alpestris in Forfarshire.—I notice in the Report for 1883 of the Botanical Record Club, that *Myosotis rupicola* Sm. (*alpestris* Schm.) has been gathered in Canlochan, Forfarshire, by the Revs. H. E. Fox and E. F. Linton. I fear, however, that plant is not indigenous in this locality, as, unless my memory deceives me, I was told by a horticultural friend that he had sown a quantity of the seed—derived from cultivated Ben Lawers plants—along with the seeds of other alpines, in Canlochan. One result of this was the discovery there, by some members of the Edinburgh Botanical Society, in 1880, *Myosotis alpestris* var. *Erinus alpinus*, *Primula Auricula*, and other aliens. I quite believe that my friend was in no degree aware of the reprehensibility of his proceedings, or that if his name was revealed it would be held in execration by all British botanists. I am sorry to say that he also sowed (unless I am mistaken) the seeds of various alpines on Ben Lawers, but so far as I can learn none of these have been found on that hill. In hope that none of the plants thus sown would have established themselves, I did not mean to put the fact formally on record; but now that *Myosotis rupicola* has been actually recorded, it seems necessary to mention it. There is, however, one consolation for botanists, and that is that I believe all the seeds sown were of those plants which from their showy flowers are in common cultivation, and hence that no obscure-flowered species, as grasses, carices, &c., if discovered hereafter in these localities, need be looked upon with suspicion.—F. Buchanan White.

NOTICES OF BOOKS.

New Books.—S. Sirodot, 'Les Batrachospermes: organisation, fonctions, developpement, classification' (Paris: 4to, pp. 299, tt. 50).—H. Correvon, 'Les Plantes des Alpes' (Geneva, Georg: 8vo, pp. 264).—W. Zopf, 'Die Pilzthiere oder Schleimpilze' (Breslau, Trewendt: 8vo, pp. viii. 174: 51 cuts).—A. Grisebach, 'Der Vegetation der Erde,' ed. ii. (Leipzig, Engelmann: 2 vols. 8vo, pp. xvi. 567, xi. 594).—O. J. Richard, 'L'Autonomie des Lichens, ou Réfutation du Schwendenérisme' (Paris, Lechevalier: 8vo, pp. 59).—R. Kauffmann-Bayer, 'Schweizer Flora' (Frauenfeld, Huber: 12mo, pp. viii. 203, tt. 4).—W. Voss, 'Versuch einer Geschichte der Botanik in Krain (1754–1883)' (Laibach, Kleinmayr: 8vo, pp. 59).

Articles in Journals.

American Naturalist.—E. J. Goff, 'Relation of colour to flavour in fruits and vegetables.'—A. F. Foerste, 'Flowers of *Zygadenus glaucus.*'—W. J. Beal, Seeds burying themselves in the ground.—J. B. Ellis & G. Martin, 'New N. American Fungi' (*Phyllosticta leucothöes*, *P. sinuosa*, *P. corylina*, *P. apocyni*, *Sacidium polygonati*).

Bot. Centralblatt (No. 52).—A. Rothpletz, 'Zur Culmformation bei Hainichen in Sachsen.'

Bot. Zeitung (Dec. 5, 12).—H. Solms-Laubach, 'Der botanische Garten zu Buitenzorg auf Java.'—(Dec. 12). W. Detner, 'Untersuchungen über Salzäurebildung in der Pflanze.'

Botaniska Notiser (haft. 6).—E. Ljungström, 'Kleistogami hos *Primula sinensis.*'—A. L. Grönvall, 'Om *Ulota intermedia* Sch. och das nörmaste samslägtingar.' — A. Callmé, *Polygonum tomentosum* (*lapathifolium*) × *P. Hydropiper.*

Bulletin of Torrey Bot. Club (Oct.).—J. Schrenk, The Haustoria of *Gerardia* (1 plate). — J. B. Ellis & W. A. Kellermann, 'Kansas Fungi.'

Flora (Nov. 11). — J. Müller, 'Lichenologische Beitrage' (*Pleurocybe*, gen. nov.). — P. G. Strobl, 'Flora der Nebroden' (contd.).—(Dec. 11). J. Müller, 'Revisio Lichenum Eschweilerianorum.'—(Dec. 21). J. Freyn, 'Phytographische Notizen' (*Viola adriatica*, n. sp. vel subsp.; *Melampyrum catalaunicum* n. sp. vel subsp.; *Euphrasia Willkommii*, n. sp.).

Garden (Dec. 6). — *Œnothera marginata* (ic. pict.). — (Dec. 20). *Bignonia Cherere* (ic. pict.).

Gardeners' Chronicle (Dec. 5). — *Rhododendron Toverenæ* F. von Muell., sp. n. (fig. 127). — W. G. Smith, 'Disease of Parsnips' (*Peronospora nivea* Ung.), (figs. 124, 125). — (Dec. 13). A. J. Wilson, 'The Potato Disease' (figs. 130, 131).—(Dec. 20). *Smilax aspera* var. (fig. 134). — (Dec. 27). *Coelogyne Rossiana* Rchb. f., sp. n.; *Primula admontensis* Gusmus (*P. Auricula* × *Clusiana*); *Heliotropium incanum* (?) var. *glabra* (fig. 140). — J. D. Hooker, *Pinus Jeffreyi* (fig. 141).

Journ. Royal Microscopical Soc. — G. Massee, 'Description and Life-history of a new Fungus' (*Milowia* (gen. nov.) *nivea*); 1 plate.

Midland Naturalist.—W. B. Grove, 'On the *Pilobolidæ* (concl.). —J. E. Bagnall, 'A Fungus Foray in the Middleton District.'

Œsterr. Bot. Zeitschrift. —H. Braun, '*Melampyrum Moravicum*, n. sp.'—J. Velonovsky, 'Zur bulgarischen Flora' (*Verbascum glanduligerum*, *Jasione glabra*, spp. nn.). — J. Bubela, 'Teratologisches.' —B. Blocki, 'Zur Flora von Galizien.'—E. Formánek, 'Zur Flora Mährens.'—E. Preissmann, 'Zur Flora von Kärnten.'

Pharmaceutical Journal (Dec. 13 & 20). — R. Cross & W. T. T. Dyer, 'Red Bark.'

LINNEAN SOCIETY OF LONDON.

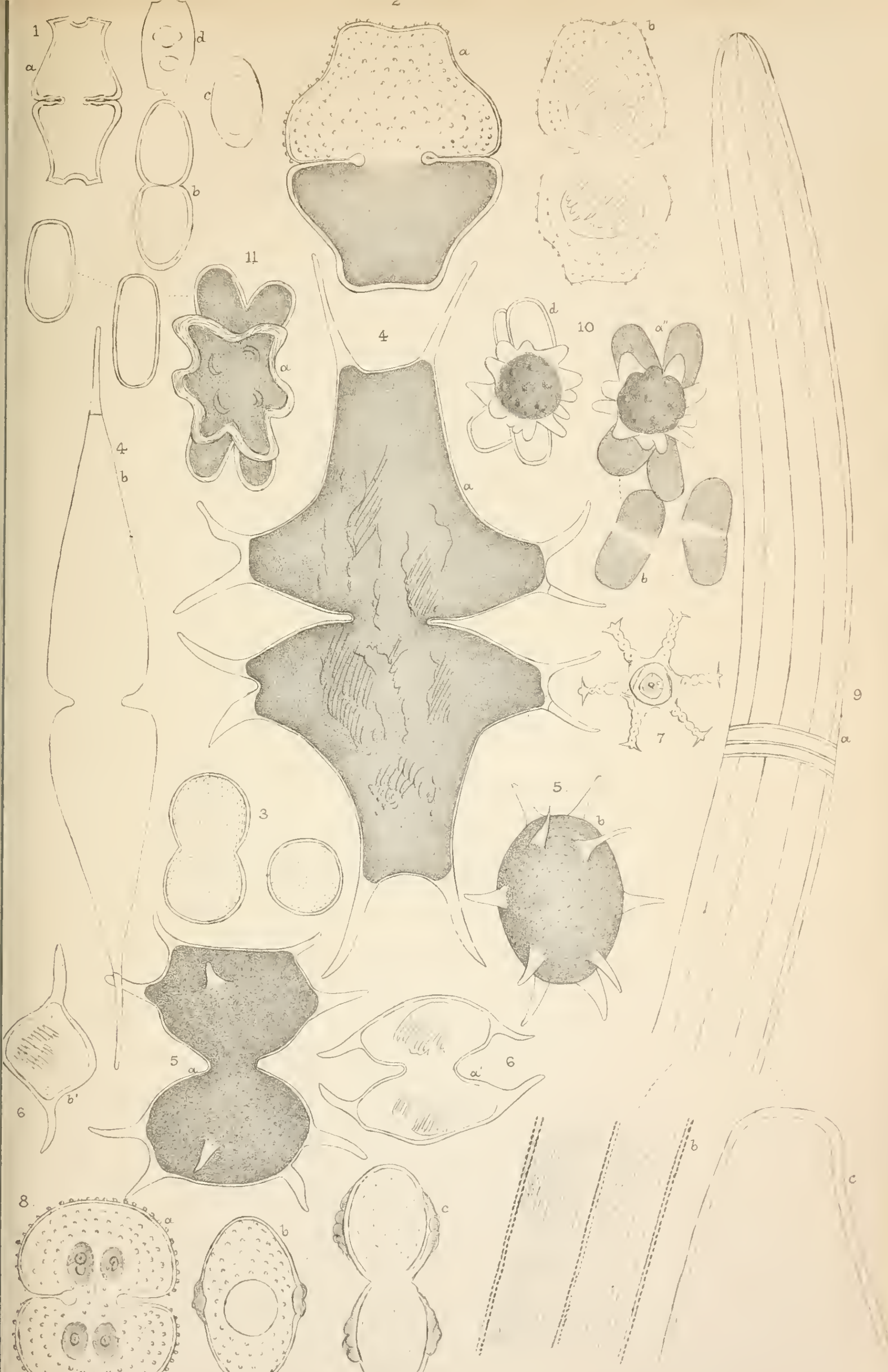
November 6, 1884.—Sir John Lubbock, Bart., President, in the chair.—A letter was read, intimating that the late President, Mr. George Bentham, had bequeathed by his will a legacy of £1000 to the Society.—Mr. W. T. T. Dyer exhibited the following plants and their products:—(1) *Vaccinium Arctostaphylos*, from which the Trebizonde Tea ("Thé-du-Bu-Dagh") is prepared at Amassia and Tokat; (2) *Pueraria Thunbergiana* from Corea, and the cloth made from it; (3) *Pachyrhiza sinensis* ("Ko-poo"), from the fibres of which the yellow and more expensive cloth is made; (4) *Dendrobium Phalænopsis* Fitz., a coloured drawing from a plant obtained by Mr. H. O. Forbes, in Timor Laut.—Mr. R. A. Rolfe afterwards exhibited examples of British oak-galls produced by cynipidean insects of the genus *Neuroterus*. These were:—(1) The silk button gall produced by *N. numismatis*, exceptionally rare this season, and found on the common English oak, *Quercus Robur*, and on *Q. lusitanica*, *Q. infectoria*, and *Q. Turneri*; (2) the globose gall, produced by *N. ostreus*, and got on *Q. Robur* and *Q. infectoria*, on the leaves of which trees it is confined to the midrib on principal veins; (3) the smooth spangle gall, of a greenish white or rose colour, flattish or saucer-shaped, destitute of hairs, produced by *Nemoterus fumipennis*, and got on *Q. Robur* and *Q. lusitanica*; (4) the pale yellowish green scarce spangle gall, produced by *N. læviusculus*, and only got by Mr. Rolfe on the common oak; (5) the common spangle gall, produced by *N. lenticularis*, and found not only on *Q. Robur*, but also on *Q. Farnetto*, *Q. Toza*, *Q. lusitanica*, *Q. infectoria* and *Q. dentata*, the latter a Japanese oak. There was also shown a remarkable blackish purple common gall, found on a variety of the common oak, *Q. Robur* var. *Granbyana*. This variety of the oak has deep purple leaves, but not so deep as in the var. *purpurea*, a fact demonstrating that the colour of the gall depends considerably on the oak leaves and not entirely on the insect producer. As a rule, the plan and details of the gall depend on the gall maker and the nature of the irritating fluid deposited by the insect, the gall itself merely representing the effort of the plant to remedy the injury done. That the character of the gall is determined at the time the egg is laid may be inferred from the circumstance that when the larva is destroyed by parasites, at the very earliest stage of gall development, the nature of the gall is not changed, though occasionally dwarfed. The galls found on the different species of oak above mentioned are all perfectly distinct from each other and from that of *Quercus Robur*.—The next communication was on a collection of plants made in Timor Laut, by Henry O. Forbes. Therein a short account is given of the nature of the islands and the general character of the vegetation, after which follows a list of about 80 plants. Professor Oliver adds a note, that this collection, so far as it goes, is made up in great part of the more widely diffused species of the Indian Archipelago. The most interesting plants appear to be, one in fruit only, referred to the meliaceous genus *Owenia*, probably *O. cerasifera*, Muell., of Queensland; a fine *Mucuna* of the section *Stizolobium*; *Delarbrea*, an araliaceous genus hitherto only received from New Caledonia; and a fruit of possibly a *Strombosia*. Mr. Forbes is inclined to regard the Timor Laut flora and fauna as having affinities with the Moluccan (Amboina) region.—There followed a note on the reproduction of the heterœcismal Uredines, by Chas. B. Plowright. The author affirms that when the reproduction of these fungi takes place without the intervention of ascidiospores, the resulting uredospores are far more abundant than in the case when they arise from the implantation upon the host-plant of the ascidiospores, this inference being supported by various detailed observations of the author.

November 20.—Professor P. Martin Duncan, F.R.S., Vice President, in the chair.—Mr. A. Roope Hunt was elected a Fellow of the Society. Mr. Francis B. Forbes drew attention to specimens of pods and seeds used by the Chinese in the place of soap. He stated that for ordinary detergent purposes, an impure earthy soda and a lye made from ashes are employed. The leaves of *Hibiscus syriacus* and *Gingko biloba* are occasionally used for cleansing the head. The most favourite substance, however, seems to be the fruit of certain *Leguminosæ*, chiefly what the Chinese call "feitsao-tow" (fat black beans). Breitschneider has no doubt that this belongs to the *Gymnocladus chinensis*, a plant originally described by Baillon only from pods received from Shanghai, and of which the leaves and flowers were for a long time unknown. There is now a specimen at Kew, from Foochow in the province of Fokien, with fruit and flowers, but only young leaves, which have been lately figured in the 'Icones Plantarum.' The specimens were exhibited with fruits and fully developed leaves, from Ningpo in Chekiang, and Wa-hu in An-whei province. The pods of *Gleditschia sinensis* of Lamarck, called by the Chinese "tsao-chio," are used for the same purposes as those of the *Gymnocladus*. The specimens now exhibited are from Peking and the Shanghai district. One of them, which Mr. Forbes had always supposed to be *Gleditschia sinensis*, appears to come from the same tree as the type specimen of *G. xylocarpa* Hance. A tree common in South China was referred by Mr. Bentham, in the 'Flora Hongkongensis,' to *G. sinensis*, but the flowers and fruits of this specimen, lately examined at Kew and the British Museum, seem to differ from the northern ones. Lamarck founded his species on a tree growing in the Jardin des Plantes, from seeds sent from Peking by Père Incarville 200 years ago; and further inquiry seems needed as to the identity of the northern and southern plants. The *Gymnocladus* pods are said by Dr. Porter Smith to be roasted and kneaded into balls as large as childrens' marbles, when they are used in washing clothes and in bathing, but on account of their unpleasant smell they are not allowed in the public baths. The seeds are used in Peking by women in washing the head and hair. In Shanghai the *Gleditschia* pods are broken in small bits and soaked in boiling water, until a considerable amount of oily substance is floated, when the water is ready for use. The specimen exhibited of *Sapindus makwinsi*, Gaert., was received from Mr. Clement Allen, British Consul at Ningpo, who stated that the Chinese there used the fruit as soap. This is doubtless the "Soap tree," or "Freichu-tszo," mentioned by Dr. Porter Smith. — Mr. H. Groves exhibited specimens of—(1) *Chara connivens*, collected at Slapton, S. Devon, the only known British slation, for no trace of the plant is now to be found at Stokes Bay; (2) *Chara canescens* (with the synonym *C. crinita*), from a pool between Helston and the Lizard, and from Little Sea, Studland, Dorset.—Mr. Geo. Murray exhibited specimens, both dried and moistened, of a species of *Glæocapsa* found by Mr. Pryer, in bird's nest caves in North Borneo; Mr. Murray also mentioned that he himself had found somewhat similar dried patches of Algæ (*Glæocapsa*) in leaves in Scotland, inhabited by pigeons.—Mr. W. T. T. Dyer showed and made remarks on some sterile runners of *Mentha piperita*, and the remains of flowers of *Epilobium hirsutum*, taken from a wreath found by Prof. Maspero in a tomb near Thebes, and supposed to be of the 20th or 26th Dynasty; he also showed some fresh flowers of *Ipomea purpureo-cærulea*.—A paper was read by Mr. E. M. Holmes, on *Cinchona Ledgeriana* as a species. The author expressed the opinion that under the name of *Cinchona Ledgeriana* a number of varieties or forms, and probably some hybrids of *Cinchona Calisaya* are now under cultivation in the British colonies. He believed that if more attention were paid to the characters afforded by the bark of the trees, taken in conjunction with the other botanical characters of flower and fruit, these varieties and hybrids would be more easily defined and recognised. He considers that the plant published under the name of *Cinchona Ledgeriana* by Dr. Trimen was probably referable to Weddell's *Cinchona Calisaya* var. *pallida* as a horticultural form, for which the author proposed the name *Trimeniana*.—Mr, E. T. Druery read a paper on a singular mode of reproduction in *Athyrium Filix-fæmina* var. *clarissima*. In a previous paper the author had shown that prothallia bearing antheridia and archegonia were developed on the apex of pear-shaped bodies with the larger end downward, in the place usually occupied by sori. In the present paper he brought forward evidence to show that these pear-shaped bodies were not developed from sporangia, but from a previous formation of thread-like bodies, a few of which became thickened and developed into the pear-shaped bodies previously mentioned, the others remaining starved and undeveloped.

December 4.—William Carruthers, F.R.S., Vice-President, in the chair.—The following gentlemen were elected Fellows of the Society:—the Hon. F. O. Dobson, LL.D., of Victoria, Australia; William A. Haswell, M.A., of Sydney, New South Wales; George W. Olfield, of London; Dr. Geo. W. Parker, of Honolulu; Michael C. Potter, M.A., of Cambridge, Vet. Surg.; Thos. J. Symonds, of the Madras Presidency; W. A. Talbot, of Yellowpore, Bombay; and J. H. Tompson, of Melbourne, Australia.—Mr. W. T. Thiselton Dyer exhibited—(1) Examples of leaves of *Sagittaria montevidensis* under different modes of cultivation; the changes thus induced as regards size and general facies being most remarkable, so much so that they might be deemed widely separate genera. The small leaves were from a plant raised from seeds collected in Chili by Mr. J. Ball, and sent to Kew in 1883, and grown in a pot half submerged in the *Nymphæa* tank. The enormously large leaf and spike were those of a plant raised from seeds ripened at Kew and sown in spring (1884). When strong enough the plant was planted in a bed of muddy soil, kept saturated by means of a pipe running from the bed to the *Nymphæa* tank. (2) A special and peculiar instrument called a "ladanisterion," from Crete, it being a kind of double rake with leathern thongs instead of teeth, and used in the collecting of gum-labdanum.—A paper by Mr. Alfred Tyler, "On the Growth of Trees and Protoplasmic Continuity," was read.

December 18.—Sir John Lubbock, Bart., F.R.S., President, in the chair.—The following gentlemen were elected Fellows of the

Society:—Lieut-Col. W. R. Lewis, Dr. Chas. B. Plowright, Messrs. T. B. Blow, H. G. Greenish, A. G. Howard, Lionel de Niceville, and F. Shrivell.—Mr. H. Ling Roth showed some roots of sugar-cane grown in Queensland and preserved in spirit, and from which he infers that the plant possesses two sorts, *viz.*, ordinary matted fibrous roots, and others of a supposed special kind. The new *Sparganium*, a note on which appears on page 26, was exhibited by Mr. W. H. Beeby. Mr. Baker expressed his opinion that the plant was undoubtedly distinct from all described species.—Mr. W. T. T. Dyer exhibited life-size photographs of cones of two species of *Encephalartos* from South Africa, viz., *E. longifolius* and *E. latifrons*, neither hitherto figured in European books. He also showed tubers of *Ullucus tuberosus* from Venezuela, which though esteemed as an esculent in South America, proved inedible when grown at Kew.—A paper was read by Mr. Henry O. Forbes, "On Contrivances for ensuring Self-fertilization in some Tropical Orchids." In this paper the author referred to some Portuguese and other European orchids, and thereafter he described in detail the structural peculiarities of certain tropical *Orchidaceæ*, which had been made the subject of study by him under favourable auspices. He arrives at the conclusion that a number of orchids are not fertilized by insects, but are so constructed as to enable them to fertilize themselves. This paper was illustrated by diagrams, referring more particularly to such forms as *Phajus Blumei*, *Spathoglottis plicata*, *Arundina speciosa*, *Eria javensis*, and genera allied to *Chrysoglossum*.—Mr. F. O. Bower read a paper "On Apospory in Ferns," this having special reference to Mr. Chas. T. Druery's observations "On *Athyrium Filix-fœmina* var. *clarissima*," previously communicated to the Society. Mr. Bower's researches, made on the microscopical investigation and growth of sporophore generation to the prothallus, without the intervention of spores, confirms the statements of Mr. Druery. He finds, moreover, the case in point to hold good in certain other ferns—for example, in *Polystichum angulare*, where there is the formation of an expansion of undoubted prothalloid nature, bearing sexual organs by a process of purely vegetative outgrowth from the fern plant; that is, there is a transition from the sporophore generation to the oospore by a vegetable growth, and without any connection either with spores or indeed with sporangia or sori. The author goes on to point out the bearing of these observations and experiments on the general life-history of the fern, so far as the modifications of the genetic cycle are concerned, and further compares this new phenomenon of "apospory" in ferns with similar cases in other plants, while insisting on the importance of the cases at issue.—A communication "On the aerial and submerged leaves of *Ranunculus Lingua* L.," was read by Mr. Freeman Roper. He shows from specimens obtained near Eastbourne, that the two sets of leaves in question differ so materially that they might not be suspected to belong to the same plant, the submerged being relatively much larger, greatly broader, ovate or cordate, and possessing abundance of stomata.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West Newman & C° imp

W Joshua del R.Morgan lith.

ON SOME NEW AND RARE *DESMIDIEÆ*. No. III.

By W. Joshua, F.L.S.*

(Tab. 254.)

The following new and little-known species have recently occurred in collections received from foreign correspondents. The plate and description of No. 1 I take from the valuable published series of Algæ of Messrs. Wittrock and Nordstedt. This small *Euastrum* was collected from *Sphagnæ*, by J. Hart, Esq., in the Blue Mountains, Jamaica.

My first acquaintance with Canadian *Desmidieæ*, from a collection forwarded in the past summer by the kindness of Mr. A. H. McKay, has brought to light a very distinct and beautiful new form of an old friend, *Euastrum verrucosum* Ehrenb.; also *Closterium Braunii* Reinsch, *Staurastrum polytrichum* Perty f. *major*, *S. lunatum* Ralfs, *Cosmarium Turpini* Breb. *β. Lundellii*, *Staurastrum orbiculare* (Ehrb.) Ralfs. f. *minor* Nordst., *Cosmarium Quasillus* Lund., *C. Botrytis β. subtumidum* Wittrr., *Hyalotheca dissiliens* f. *tridentula* Nordst., *Micrasterias americana* Ralfs. (cytioderm spinulose), *Staurastrum polymorphum* (four-rayed), *C. crenatum* Ralfs. f. *bicrenatum* Nordst., *C. Cordanum* Breb. = *Colpopelta viridis* Corda, *Xanthidium antilopeum* new var. *canadense* (a stout form with side spines in centre of semi-cell).

The new species from Rangoon are from a large collection, at present under examination, received from Dr. Romanis.

Penium spinospermum (Journ. Bot. 1883, 293) was collected by the Rev. H. W. Lett of Ardmore, Lurgan; these zygospores much resemble those of *C. globosum* Bulnh. No. 11, with its singular spore, is a somewhat rare species, new to this country. The drawings are made from specimens taken by me in the neighbourhood of Cirencester. I may here mention the valuable addition to our Desmid literature, entitled 'Desmids of the United States,' by the Rev. F. Wolle, which has recently appeared in America, and would be a decided boon to any student of this class. It is replete with a large amount of original information and excellent coloured plates. Among the eleven hundred species figured, a vast number will be recognised as having a home in this country.

1. **Euastrum incavatum** Josh. et Nordst., nov. spec.; Wittrock & Nordstedt, Algæ exsiccatæ 657.—E minimum incisura mediana lineari angusta [intra ostium paullulo dilatata; semicellulæ pyramidales e basi dilatata sensim in lobum polarem attenuatæ, lateribus læviter latissimæ retusis, angulis inferioribus oblique truncatis, lobo polari superne tantum lævissime dilatato, margine superiore late rotundato medio retuso] incavato, angulis subacutis; a latere visæ ovatæ; a verticæ conspectæ ellipticæ; anguli superiores et inferiores oblique e vertice visi obtusi utrinque parvo ornati; membrana glabra. Long. 40–43 μ; lat. 24 μ, lat. apic. 12 μ; crass. 14–16 μ. Habitu *Micrasterias* integra Nordst., *Euastrum ansatum* Ehrb. *Eu. cuneatum* Jenn. hanc speciei proxima

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* See Journ. Bot. 1882, 300; 1883, 290.

sunt. *a*, cellula a fronte; *b*, a latere; *c*, a vertice; *d*, oblique; *e*, basi visa Jamaicæ in Morces Gap ad Gordon Town. Leg. J. Hart, 1884.

2. EUASTRUM VERRUCOSUM Ehrenb. *β. simplex* n. var.—Of stout habit, terminal lobe very short and with very shallow incision; central inflation either none or very small; no other. It is nearest to the Cosm. in Reinsche's Contrib. xvi. 9; the verrucæ are perhaps somewhat larger than in the typical plant. Long. 85 μ, lat. 65 μ; width of apical lobe 33 μ, thickness 25 μ.

3. COSMARIUM VIRIDIS Corda, *Colopelta viridis* Corda, in Almanach de Carlsbad, 1835, p, 206, T. 11, f. 28; *Cosmarium Cordanum* (Breb.) Rabenh. Fl. Europ. Alg,, P. iii. page 177.—It approaches nearly to a species figured by De Notaris among the forms of *C. palangula*, fig. 34 c. G. Notaris de Elementi per lo studie delle Desmidiaceæ italiche; also to the forms of *C. globosum* and *P. curtum* in Wille, Novaja-Semlja, Taf. xii. f. 43 and 73. In the absence of any definite knowledge of the size of Corda's plant I think it best to class it as above. Pictou, Nova Scotia. Length 55 μ, breadth 30–33 μ; breadth of constriction 22 μ.

4. **Micrasterias ceratofera,** n. sp. — Large, about one and a half times longer than broad, deeply constricted at middle, leaving a wide angle; semi-cells three-lobed, angles bifid, furnished with a strong spine. Polar lobe much attenuated, and having the spines rather longer. This distinct and remarkable species appears to bear the nearest relation to *Micrasterias arcuata* Bail. and *M. ascendens* Nord., but at first sight I was in some doubt whether its true position might not be with the *Staurastræ*. Membrane smooth, length (s. acul.) 27 μ, breadth (s. acul.) 55 μ, thickness 27 μ, breadth of isthmus 20 μ, width of polar lobe (s. acul.) 30 μ. Rangoon, British Burmah, October, 1883.

5. XANTHIDIUM ANTILOPEUM (Breb.) Kutz., new var. *canadense*—Large cells much inflated, deeply constricted, truncate; spines stout; cytioderm minutely punctate, possessing no protuberance or granulation, resembling the var. *Minneapolense* Wolle, Desmid. U. States, L. ii. f. 16, in the possession of a fifth pair of spines, the extra pair in the centre of each semi-cell. Pictou, Nova Scotia. Length 77 μ, breadth (s. acul.) 53 μ (c. acul.), 83.90 μ, breadth of isthmus 14 μ.

6. **Arthrodesmus gibberulus,** n. sp. — Medium size, cells elliptic with strang convergent spines; without spines about as long as wide, membrane smooth, cells with large inflation at the upper side, giving them in the end view an almost spherical appearance. Rangoon, British Burmah. Length 36 μ, breadth (s. acul.) 35 μ (c. acul.) 54 μ, thickness 25 μ, breadth of isthmus 13 μ.

7. **Staurastrum minusculum** nov. sp.—Very minute, smooth, semi cells subcuneate with rounded ends, slightly convex; angles produced laterally into straight diverging arms, rather longer than the diameter of cell, surmounted by four aculeate spines set at right angles. Nearest to *S. gracile* Ralfs, but differing in its smaller size and forked apices. Length of arm 12.13 μ, diameter of cell 10 μ. Rangoon, British Burmah.

8. Cosmarium Turpini Breb. n. var. *cambricum*. — Rather smaller than the typical form, more rotundate, less truncate; basal angles less protruded; form of central inflation two distinct ovals set obliquely; composed of oblong granules. Length 60 μ, thickness including inflation 35 μ, width 50·60 μ, breadth of isthmus 17 μ. Col. J. E. Griffiths, F.L.S. Bangor, N. Wales, 1881.

9. Closterium Braunii Reinsch., De speciebus generibusque, nonnullis novis Ex. Alg., P. Reinsch, 1867, Tab. 1. c. — Sparingly among other Algæ. Pictou, Nova Scotia, 1884.

10. **Penium spinospermum** n. sp.—Small, about two and a quarter times longer than wide, subcylindrical, with a very slight median construction; apices round, very slightly attenuated; membrane smooth; zygospores in young state globose and smooth, when mature thickly covered with obtuse projections. Length 33 μ, breadth 25 μ, breadth of zygospore (s. acul.) 23 μ, length of processes 7½ μ. Derrystrasna Bog, Co. Armagh, Ireland. Rev. H. W. Lett.

11. Penium phymatosporum Nordst., Desmidieæ et Œdogonieæ ab O. Nordstedt in Italia et Tyrolia collectæ, Tab. xii. f. 1., p. 26.—Four or five specimens of the spore of this Desmid, with cells attached, occurred in a collection made by me at Minety, in September, 1881, from which my drawing was made. New to Britain. It bears a close resemblance in shape of plant and in form of the remarkable zygospore to the Italian specimens; but I have not been able to detect the longitudinal striæ in the membrane which Nordstedst's specimens appear to possess, somewhat similar to *P. polymorphum* Lund.

Explanation of Tab. 254.—1. *Euastrum incavatum* Josh. et Nordstedt, from the fig. in Wittr. & Nordstedt's Alg. Exsic., × 570. 2. *Euastrum verrucosum* Ehrb. f. *simplex* n. var., × 450. 3. *Cosmarium viridis* Corda, × 450. 4. *Micrasterias ceratophora*, n. sp., × 450. *a*, front view; *b*, side view. 5. *Xanthidium antilopeum* Breb. f. *canadense;* front and end view, × 450. 6. *Arthrodesmus gibberulus* n. sp., × 600. *a*, front view; *b*, end view. 7. *Staurastrum minusculum*, n, sp., × 600. 8. *Cosmarium Turpini* Breb., f. *cambricum* n. var., × 450. 9. *Closterium Braunii* Reinsch. *a*, plant in front view, × 300; *b*, a portion of same enlarged, × 900; *c*, apex, × 900, 10. *Penium spinospermum*, n. sp., × 450. 11. *Penium phymatosporum* Nordstedt, × 450.

A NEW *CAREX* FROM SUMATRA.

By H. N. Ridley, M.A., F.L.S.

Carex tartarea, n. sp. — Rhizomate brevi; foliis glaucis copiosis confertis rigidis, linearibus acuminatis recurvis perscabris; culmis crassiusculis pedalibus triquetris rigidis; foliis caulinis 4–5 ampliatis; spiculis femineis uncialibus pedunculatis numerosis e vaginis inferioribus emergentibus; spiculis masculis paucis terminalibus; squamis lanceolatis obtusis purpureis apice scariosis mucronatis carinatis, mucrone scabro; utriculis rostratis elongatis excurvis utrinque angustatis, marginibus scabris nigris lucidis;

rostro breviter bifido dentibus obtusis scabris; stylo brevi trifido; caryopsi obovata triquetra breviter apiculata.

Sumatra (Parsoemah Region), H. O. Forbes, No. 2444 in Herb. Brit. Mus.

This *Carex* belongs to the Bengalensis section, with some affinity to *C. baccans* Nees. It has a close tuft of rough stiff recurved leaves, from which springs a short stout culm, bearing a somewhat compact panicle. The spikelets are about an inch in length and slender; they are borne on long peduncles, which are for the most part concealed in the swollen vaginæ of the culm leaves, from the axils of which the spikelets spring. The laminæ of these leaves resemble those of the radical leaves; the lower ones are three inches in length. The lower spikelets are all female, the males being few in number in the upper part of the panicle. The narrow long-beaked utricles, when ripe, are excurved, almost black, the beak shortly notched, scabrid. The length of the mucro of the glume varies very much.

NOTES ON MIDDLESEX PLANTS.

By John Benbow.

A brief notice of some plants gathered during the past summer in the north-western districts of the county may be of interest, although the ground covered has been too well worked to yield a very rich harvest. My gleanings, however, show that many species find no place in the 'Flora of Middlesex' for these districts. The search, moreover, has proved the absence of plants in numerous localities where they are stated to grow "abundantly." Records from stations of limited, well-defined areas are in the majority of instances obsolete, and might well be placed within excluding brackets. The following list—supplementary to several previous notes—includes a few only of the species thus omitted, or gathered in new stations:—

Ranunculus circinatus. In many places from Southall to Harefield.

Senebiera didyma. Gravel-pits, Dawley, near Hayes.

Reseda lutea. Said to grow "only in Harefield chalk-pits"; is common about Springwell; grows sparingly on a gravelly bank skirting Uxbridge Common, and in a meadow near Jack's Lock.

Silene noctiflora. West Drayton.

Stellaria glauca. Staines Moor (in addition to previous record of "Moor north of Uxbridge").

Malva borealis. Near Uxbridge.

Geranium lucidum. Cowley.

Rhamnus catharticus. Said to grow "near Harefield, but just out of Middlesex"; is to be found in a meadow south of Harefield.

Lotus tenuis. In great profusion for a mile or two on railway-banks between Uxbridge and West Drayton.

Pyrus Aria. Several fine trees skirt Old Park Wood on the north. — *P. torminalis.* Recorded as "just out of the county, in Herts"; is to be found sparingly in hedgerows about Harefield.

Epilobium macrocarpum. Very abundant in swampy copses from Uxbridge Common and Swakeleys to Ickenham. — *E. roseum.* Ditch by Warren Pond, Breakspeares; and Old Park Wood. — *E. palustre.* Bog close to Moor Hall.

Myriophyllum verticillatum. Uxbridge Moor, Harefield Moor, and elsewhere.

Chrysosplenium oppositifolium. In a boggy corner of Old Park Wood, abundantly.

Torilis nodosa. On a sandy bank, Uxbridge Moor.

Galium Cruciata. Apparently very scarce; I have met with only a single plant in Long Lane, Hillingdon.

Dipsacus pilosus. Plentiful in a copse, and on banks near Denham Lock; Harefield Road, near Moor Hall.

Inula Helenium. Several plants in a wet meadow near Northwood (extinct in Blackstone's stations). — *I. Conyza.* Several plants in an old pit in the meadow between Jack's Lock and the Copper Mills (extinct in the "old chalk-pit" as recorded by Blackstone).

Pulicaria vulgaris. On the west side of Staines Common, close to the London Road, plentifully. (Cannot find this in any of the stations recorded).

Serratula tinctoria. This also seems very scarce; I have met with it only at Pole Hill, Hillingdon.

Centaurea solstitialis. Two or three plants in fields above Uxbridge (introduced).

Carduus tenuiflorus. Staines Moor.

Gentiana Amarella. This species, with *Campanula Trachelium* and *Chlora perfoliata*, appears to extend over a wider area than supposed; it grows by the side of an old pit at Springwell; abundantly on the steep slopes of the down beyond, and sparingly on chalky banks to the boundary.

Villarsia nymphæoides. Grows higher up the Thames than Walton Bridge.

Cuscuta Trifolii. Very abundant in clover-fields about Springwell.

Echium vulgare. In the same fields.

Lithospermum arvense. About Colnbrook.

Hyoscyamus niger. Near Uxbridge Common. (Grew lately near Cowley, on waste ground by the Colne, but now extinct).

Mentha gentilis. In some quantity in the marshy bottom of a heathy waste near Northwood. (Mr. Arthur Bennett has kindly named this plant).

Calamintha officinalis. In several places about Harefield, and evidently—as suggested by the authors of the 'Flora of Middlesex'—the var. *Briggsii.* — *C. Acinos.* Mr. Newbould's record of "a single specimen in the old chalk-pit, Harefield" is somewhat misleading: it grows there plentifully, and is a troublesome weed in the fields above.

Nepeta Cataria. About Harefield, in several places, sparingly.

Lamium incisum. Pottery-field on Uxbridge Common.

Anagallis arvensis var. *cærulea.* Two plants in a field by Uxbridge Common.

Rumex maritimus and *R. palustris.* A few plants of each species still hold their ground this summer; but the swamp is now filled up, and rows of cottages built upon the site.

Fritillaria Meleagris. Several patches in Swakeley's Park, near Uxbridge, but fast being rooted up for garden-culture.

Potamogeton rufescens. Abundant in ditches from junction of canal and river to Springwell Lock; also sparingly in a ditch close to Denham Fishery, — *P. mucronatus.* Canal between Denham and Moor Locks, and in old docks at Southall, plentifully. (Both these pondweeds have been verified by Mr. Arthur Bennett). Other species, though common in the district, are omitted in the 'Flora of Middlesex, viz., *P. lucens*, *P. pusillus*, and *P. flabellatus.*

Scirpus fluitans. Pond by the Lodge leading to Swakeley's Park from Uxbridge Common (not on Harefield Common).

Carex pulicaris. Wet meadow near Bayhurst Wood. — *C. disticha.* Not uncommon. — *C. paniculata.* This sedge, quite common in District 1, is omitted from 1, 2, and 3. It is very abundant from Uxbridge to Harefield, by sides of river, canal, and ditches adjoining. — *C. axillaris.* Plentiful in a lane east of Uxbridge Common; sparingly in lanes about Blackenbury Farm, Ickenham Green, West Drayton, &c. — *C. stellulata.* Moor below Dew's Farm; by pond on Duck's Hill Farm, Northwood. — *C. pallescens.* Abundant in a wet meadow by Bayhurst Wood. — *C. strigosa.* Old Park Wood. — *C. pendula.* Eastcott and district. — C. *pilulifera.* Lane near Pinner Station (not on Harefield Common. — *C. flava.* Moor below Dew's Farm; side of pond on Duck's Hill Farm, Northwood. — *C. binervis.* Harefield Common, sparingly (not on Ruislip Common). — *C. Pseudo-cyperus.* Harefield Moor, very sparingly.

Triticum caninum. Plentiful in places on the wide hedge-banks between Dew's Farm and Moor Hall.

Nitella translucens. Ruislip Reservoir.

On reference to the table of "comparison with adjacent counties" appended to the 'Flora of Middlesex' it will be seen that four of the species found last summer are there said to be "wanting" in the county, viz., *Anagallis arvensis* var. *cærulea*, *Centaurea solstitialis*, *Crepis biennis*, and *Potamogeton rufescens;* whilst *Sisymbrium Sophia*, *Mentha gentilis*, and *Ophrys apifera* are excluded from the 'Flora' as extincts.

LORANTHI SPECIEM NOVAM CHINENSEM

Præbet H. F. Hance, Ph.D.

Loranthus (Macrosolen, racemulosi) **Fordii**, sp. nov. — Glaberrimus, ramis ramulisque subtetragonis cortice cinereo suberoso valde lenticelloso tectis, foliis oppositis coriaceis oblongis vel lanceolatis obtusiusculis lucidulis penninerviis costa subtus modice nervis parum prominulis 3–3¼ poll. longis 12–14 lin. latis petiolo 5-lineali, pedunculis axillaribus solitariis 7 lin. longis apicem versus racemoso-paucifloris, bracteis ?, bracteolis binis ovatis, calyce sesquilineali margine truncato denticulato pedicello paulo longiore fulto, corollæ rubræ ? subcylindraceæ 4–5 lin. longæ petalis 6 ad duas tertias longitudinis in tubum coalitis lobis oblongis reflexis intus tomentellis, genitalibus sub anthesi exsertis, antheris basifixis, stigmate globoso.

Juxta Pu-kong, prov. Cantonensis centralis, m. Aprili 1882, coll. C. Ford (Herb. propr. n. 22225.)

Proxime accedit *L. subumbellato* Bl. (Fl. Jav. Loranth. t. 18) qui, ex b. Miquelii sententia, *L. sphærocarpi* Bl. tantum varietas.

A CONTRIBUTION TOWARDS A FLORA OF BRECONSHIRE.

By W. Bowles Barrett, F.L.S.

There are still two or three Welsh counties the flora of which is comparatively little known. Amongst such, Breconshire (County 42), held, till quite lately, a prominent place, passing almost unnoticed in 'Topographical Botany,' ed. ii. This fact led me to visit the county in August last, and I spent the closing three weeks of that month in examining the Breconshire flora.

I believe that, at the date of my visit, the total number of species actually recorded for the county amounted to 356 only; for the larger number of these we were indebted to the Rev. Augustin Ley, M.A., who had made several botanical visits there between 1873 and 1883, and who has an intimate acquaintance with the botany of the Black Mountain district. Of the 356 species referred to, only 186 appeared in the 2nd edition of 'Topographical Botany,' 140 additional species were recorded by Mr. Ley, in the Report of the Botanical Record Club for 1881, and 22 were added by Miss Fryer in April last (Journ. Bot. 1884, p. 124). A further list was published in December last, in the Report of the Botanical Record Club for 1883, of 129 new county records of plants observed by Mr. Ley in that year; 105 additional new records for the county, of so-callled "species," and 24 of segregates and varieties, were made by me in August last, and are embodied in this paper. Mr. Ley and Mr. H. N. Ridley, F.L.S., have obligingly communicated the names of eight additional species, either observed by them, or specimens of which are preserved in the Brit. Mus. Herb. The present census of Breconshire plants is thus brought up to 590 species.

By far the larger portion of the county consists of old red sandstone, which is distinguished from that forming the subsoil of Herefordshire chiefly by its extraordinary elevation. The upper portion of this formation, consisting of sandstone and conglomerate, occupies the summits of the Vans (Beacons), and other lofty mountains, presenting some of the grandest exhibitions of the old red sandstone to be seen in England or Wales. Silurian rocks occupy the extreme north of Breconshire. The coal and iron tract comprises a narrow district along the whole southern side of the county. The western side is distinguished by greywacke slates. The transition rocks are singularly devoid of limestone. The county, in its general character, is distinguished by its extensive valleys and continuous and lofty mountain tracts. Only about two-thirds of it are under cultivation; the southern portion is especially wild and elevated. A semicircular range of mountains, comprising the Black Mountain group on the east, the Brecon Beacons towards the south-west, and Mount Capellante and the Breconshire Van towards the west, attain altitudes of from 2500 feet or thereabouts to 2862 feet, while a long barren chain, called Mynydd Epynt, stretches across the county in a north-easterly direction, between Trecastle and Builth. The annual rainfall is large, especially in the mountain regions; it may be averaged, throughout the county, at about forty inches. The rivers are very numerous, each large stream possessing many tributaries.

The almost tropical heat, at the time of my visit, forbad much mountain work; moreover, the extraordinary drought had rendered the hills comparatively bare. For the most part, therefore, my excursions were made in the basins of the Tawe, Taff-Vechan, Rhymney, Usk, Llynvi, Wye, and Irvon rivers, and around Llangorse Lake.

The flora of Breconshire is semi-montane in character, but, in consequence of the inland position of the county, the uniformity of soil, and the large tracts forming elevated moors or mountain ranges where the surface is still in a state of nature, the flora is by no means rich or varied. Many plants, frequent in most parts of England, seem here to be scarce or absent, points to which I have drawn attention in the following list. It is not unlikely that hereafter the flowering plants and ferns of the county may be brought up to about 670; that number, however, is small for a county 35 miles in length, with a breadth of 20 miles, and a surface presenting such great variations in altitude.

The most interesting ground to the botanist is to be found on the Brecon Beacons, in the Black Mountain district, the neighbourhood of Pen-y-wyllt, the shores of Llangorse Lake, and the Rhymney Valley. Among the rarer plants of the Brecon Beacons are *Thalictrum montanum*, *Caltha minor*, *Cerastium alpestre*, *Alsine verna*, *Sedum Rhodiola*, *S. Forsterianum*, *Saxifraga oppositifolia*, *Hymenophyllum Wilsoni*, and *Asplenium viride*. In the Black Mountain district are found *Meconopsis Cambrica*, *Viola lutea*, *Geranium sylvaticum*, *Pyrus rupicola*, *Saxifraga sponhemica*, *S. hypnoides*, *Myrrhis odorata*, *Hieracium prenanthoides*, *Vaccinium Vitis-idæa*, *Cystopteris dentata*, *Polypodium Phegopteris*, *P. Dryopteris*, *P. Robertianum*, and *Lycopodium alpinum*.

I have collected in this paper all the records known to me of Breconshire plants, hoping that thereby some little additional light may be thrown on plant distribution over the extensive inland tracts of old red sandstone to be found in the subprovince of South-east Wales.

I am greatly indebted to the Rev. A. Ley, who has most kindly allowed me to incorporate his extended observations with my own, and has communicated much valuable information relating to the botany of the county. My grateful acknowledgments are also due to Mr. J. G. Baker, F.R.S., the Rev. W. W. Newbould, F.L.S., and the Rev. W. Moyle Rogers, F.L.S., for kind assistance in identifying some critical plants. I am responsible for all the plants and stations against which no authority is attached. The nomenclature of the 7th edition of the London Catalogue has been adopted in this paper. Those plants which are new records for the county, in the sense of not having been recorded either in 'Topographical Botany,' or in either of the lists before alluded to, are distinguished by the prefixed asterisk; C stands for common, F for frequent.

Thalictrum minus var. b. *montanum* E. B. Craig-y-gledsiau, Brecon Beacons; *A. Ley.*—*T. majus* var. *flexuosum* R. *teste;* J. G. Baker; Wye Banks, near Erwood; *A. Ley.* — *T. flavum* L., var. a. *sphærocarpum.* On the Llynvi, Three Cocks Junction; *A. Ley.* In bushy stony places on both sides of Llangorse Lake. A rare plant in S. Wales.

Anemone nemorosa L. F. in the valleys; *A. Ley.*

Ranunculus circinatus Sibth. Llangorse Lake; *A. Ley.* — *R. penicillatus* Dum. (*pseudo-fluitans* Bab.) In the Llynvi, near Glasbury; *A. Ley.* — *R. Lenormandi* F. Schultz. Elan and Honddu Valleys; *A. Ley.* Vale above Rhymney Bridge Station. Mountain above Pentwyn. Dolygaer Reservoir.—*R. hederaceus* L. Near Capel Coelbren; *A. Ley.* Rare. Bog, Epynt Hill, near Garth.—**R. sceleratus* L. Llangorse Lake, very sparingly. — *R. Flammula* L. C. Widely distributed.—*R. Lingua* L. Llangorse Lake, abundant (both the glabrous and hairy forms). — *R. auricomus* L. Near Brecon; *Miss Fryer.* — *R. acris* L. C. Crag, under summit of Brecon Beacons, alt. 2700 ft.; *A. Ley.* — *R. repens* L. C. — *R. parviflorus* L. In a turnip field, Three Cocks Junction; *A. Ley.* — *R. Ficaria* L. Near Brecon; *Miss Fryer.*

Caltha palustris L. Frequent; var. *C. minor.* Brecon Beacons; *A. Ley.* Vale above Rhymney Bridge Station. Marshy ground, Brynmawr. Epynt Hills.

Trollius europæus L. At Upper Culhepshy; *E. Foster*, 1805, *Herb. Mus. Brit.* Riverside, Pen-y-wyllt. Bushy places near Llangorse Lake.

**Berberis vulgaris* L. Roadside hedge, Llanthetty, near Talybont; Possibly introduced.

Nymphæa alba L. *F. A. Lees, ms.*, Top. Bot. ed. ii. Llangorse Lake; *A. Ley.*

Nuphar lutea Sm. Apparently rare. Ditches adjoining Llangorse Lake.

Papaver Rhœas L. (recorded by Rev. A. Ley), and *P. Argemone* L. nowhere seen; in fact poppies are rather scarce in S. Wales.—**P. Lamottei* Bor. Enclosed ground, Three Cocks Junction.—**P. Lecoqii* Lamot. Talybont. Three Cocks Junction.

Meconopsis cambrica Vig. Rocky stream-sides at Rhydgoch, near Brecon; Grwyne-faur Valley, Black Mountain district; doubtful native at latter station; *A. Ley.* Wood, Gilwern. Ravine at Ffrwdgrech Waterfall, near Brecon.

**Chelidonium majus* L. Frequent in and near villages; probably introduced.

Corydalis claviculata DC. *Top. Bot., ed. ii.*

**Fumaria confusa* Jord. The most frequent segregate. Noted on shore of Usk, Talybont. Roadside, Llangorse. Talgarth. Three Cocks Junction, abundant. Alltmawr, opposite Aberedw, near Builth, abundant. (*F. Borreri* Jord. appears in Bot. Rec. Club. Rep. 1883 as a new county record for Brecon, the specimen having been found by the Rev. A. Ley. He has sent me a duplicate; it must, I think, certainly go with *confusa*, although the fruit pedicels are somewhat reflexed).—*F. officinalis* L. Uncommon. Enclosed ground, Three Cocks Junction. Fallow ground near Builth.

Sinapis arvensis L. C. — *S. alba* L. Waste land, Three Cocks Junction; *A. Ley.* Llanthetty, near Talybont; Hay. — *S. nigra* L. Banks of Wye; Hay.

Sisymbrium officinale Scop. C. — *S. Alliaria* Scop. F. Noted at Gilwern, Builth, &c.

Brassica campestris; *A. Ley.*

**Cheiranthus Cheiri* L. Old walls, Brecon. Introduced.

Cardamine pratensis L.; *A. Ley.* — **C. hirsuta* L. C. — **C. sylvatica* Link. C. By river-sides, &c., throughout the county. — *C. impatiens* L. Near Builth; *A. Ley.*

Arabis thaliana L. Walls at Llyswen; *H. N. Ridley.* — *A. hirsuta* Br. Limestone rocks, Pen-y-wyllt.

Barbarea vulgaris Br. F.

Nasturtium officinale Br. C. — *N. palustre* DC. Frequent in river-beds. Shores of Usk, Talybont. Llangorse Lake. The Usk. Brecon, not common. The Wye, Hay, plentiful.

**Draba verna* L. C.

Thlaspi arvense L. Not seen.

Capsella Bursa-pastoris Mœnch. C.

Lepidium Smithii Hook. Railbanks, Newbridge; *A. Ley.* Pen-y-wyllt. Talybont, near Builth. — *L. campestre* Br. Not seen.

Senebiera didyma Pers. Plentifully by roadsides at Hay. — *S. Coronopus* Poir. Not seen. It is remarkable that this species has not been recorded for either of the three neighbouring counties of Radnor, Montgomery, and Merioneth; from some of these it is probably absent.

Reseda Luteola L. Top. Bot. ed. ii. Not seen by Rev. A. Ley or myself.

Helianthemum vulgare Gaert. On limestone crag, Rhiwarth. Pen-y-wyllt; *A. Ley.*

Viola palustris L. Rare. Near Pen-pont, about 2½ miles north of Pont-nedd-fychan; *A. Ley.* Only seen in mountain bog, Pen-y-wyllt, sparingly.—*V. hirta* L. Not seen.—*V. odorata* L. Near Brecon; *Miss Fryer.* Apparently scarce. — *V. Riviniana* Reich.

Very C: * for segregate. — *V. Reichenbachiana* Bor. Carefully searched for, but not seen. No *canina* seen. — *V. tricolor* L. Near Nant-gwyllt, about five miles south-west of Rhayader; *A. Ley.* — Var. *arvensis.* Partricio; *A. Ley.* Cultivated ground, Llangorse, Brecon, Three Cocks Junction. — *V. lutea* Huds., *D. Turner ms.*; Top. Bot. ed. ii. Rare. One small patch at base of Black Mountain, three miles south of Hay; *A. Ley.*

Drosera rotundifolia L. Hill-side near Nant-Gwyllt; Honddu Valley, Black Mountain district, scarce; at base of the hills, four miles above Llanthony Abbey; *A. Ley.* Rare. Only seen in moory swamp, Pen-y-wyllt. — *D. intermedia* Hayne. Not seen.

Polygala vulgaris L. Appears to be uncommon in South Breconshire. Frequent elsewhere. — **P. depressa* Wender. Talybont. Builth.

**Silene inflata* Sm. Pen-y-wyllt. Brynmawr; a few plants only. Much less frequent than in South-west England. — *S. maritima* With., "2800 feet"; Top. Bot. ed. ii. Northern precipice of Brecon Beacons, finer and more plentiful than I have ever seen it inland; *A. Ley.*

Lychnis vespertina Sib. F. — *L. diurna* Sib. C. The rare form with white flowers, by roadside between Talybont and Llanthetty. — *L. Flos-cuculi* L. Cwm-Tarell Valley, five miles south-west of Brecon; *A. Ley.* Dolygaer. Llangorse. Builth.— *L. Githago* Lam. Not seen.

Cerastium glomeratum Thuil. and *C. triviale* L. C.—*C. triviale* var. d. *alpestre.* Crag under head of Brecon Beacons. New to the Principality; *A. Ley.*

**Stellaria aquatica* Scop. Shores of Usk, Talybont. Llangorse and neighbourhood. — *S. media* With. F. — *S. Holostea* L. C. — *S. graminea* L. F. — *S. uliginosa* Murr. Riverbeds, &c. Abundant in South Breconshire, less common towards north.

Arenaria trinervia L. C. — *A. serpyllifolia* L. Near Brecon; *A. Ley.* Not very common. Talyllyn. — Var. **leptoclados.* Sides of railway near Talyllyn.

Alsine verna Bartl. Crag under head of Brecon Beacons, abundant. Confirmation of queried record in Top. Bot.; *A. Ley.*

Sagina apetala L. Three Cocks Junction; *A. Ley.* Uncommon, except on arable lands. Talybont. Near Brecon. Hay. — *S. ciliata* Fr. Locality forgotten; *A. Ley.* — *S. procumbens* L. Remarkably abundant. —**S. nodosa* Meyer, var. *glandulosa.* Rare. Several plants by mountain rivulets above Pentwyn.

Spergula arvensis L. Nant-gwyllt; Partricio, *A. Ley.* Widely diistributed. Noted at Brynmawr, Talybont, Hay, Garth.

Spergularia rubra Fenzl. Casual on rail between Doldowlod and Rhayader; *A. Ley.* Abundant on sandy swampy ground at Brynmawr, apparently native.

**Scleranthus annuus* L. Apparently uncommon. Bed of Usk, Talybont, in some plenty. Arable land near Brecon.

Montia fontana L. Near Aber Elan; *A. Ley.* Vale above Rhymney Bridge Station. Swampy ground, Brynmawr. Builth.

Hypericum Androsæmum L. Rare. Gilwern. — *H. perforatum*

L. Widely distributed. — _H. dubium_ Leers. Top. Bot. Ed. ii. — _H. tetrapterum_ Fries. Widely distributed. — _H. humifusum_ L. Nant-Gwyllt; Newbridge; _A. Ley._ Llangorse; _H. N. Ridley._ Apparently not common. Gilwern. Dolygaer. Near Brecon. Builth. — *_H. pulchrum_ L. F. Pen-y-wyllt. Gilwern. Talybont. Llangorse. Brecon. Builth. — *_H. hirsutum_ L. Not common. Llanhamlach. Llangorse. Brecon. Hay.—_H. Elodes_ L. Not seen.

Malva moschata L. Near Brecon; _Miss Fryer._ Roadsides and hedge-banks, frequent and characteristic. Talybont, abundant. Llangorse. Three Cocks Junction. Builth. — _M. sylvestris_ L. F., but somewhat sparingly distributed. — _M. rotundifolia_ L. Not seen.

Tilia intermedia DC. Planted. Brecon; _A. Ley._— _T. parvifolia_ L. "Native, _E. Lees_," Top. Bot., ed. ii.

Linum catharticum L. Generally distributed and remarkably abundant. — _L. usitatissimum_ L. Railway bank, Doldowlod, introduced; _A. Ley._

Geranium sylvaticum L. Mountain rocks, Taren r' Esgob; _A. Ley._ — _G. pratense_ L. Usk, above Brecon, frequent; _A. Ley._ Scarce. Near Talybont. Three Cocks Junction. Builth. Always in small quantity. — _G. molle_ L., _G. dissectum_ L., and _G. Robertianum_ L. C. — *_G. columbinum_ L. Roadside by Three Cocks Junction; _H. N. Ridley_, 1884. Rare. Only seen in border of cornfield, Talybont. — _G. lucidum_ L. In the sheltered and warmer parts of the district. Pen-y-wyllt. Gilwern. Alltmawr near Builth.

*_Erodium cicutarium_ Herit. Only seen once on shore of Wye, Builth; one plant.

Oxalis Acetosella L. Generally distributed and exceedingly abundant.

*_Ilex Aquifolium._ L. C.

Euonymus europæus L. Not seen.

Rhamnus catharticus L. Limestone rocks, Rhiwarth, Pen-y-wyllt; _A. Ley._

Acer Pseudo-platanus L.; _A. Ley._ — _A. campestre_ L. C.

*_Ulex europæus_ L. C. — _U. Gallii_ Planch. Abundant on hillsides, &c., and widely distributed.

*_Genista tinctoria_ L. Near Garth. Hillside, Builth. — _G. anglica_ L. Not seen.

Sarothamnus scoparius Koch. Generally distributed; abundant.

*_Ononis arvensis_ Auct. C. — Noted at Gilwern, Talybont, Brecon. The form without spines alone seen.

Anthyllis Vulneraria L, Pen-y-wyllt; _A. Ley._ Railway bank, Pontsticil, probably a casual. — Var. *_Dillenii._ Between Brecon and Trecastle; _Lady Wilson_, 1808, _Herb. Brit. Mus._

*_Medicago lupulina_ L. C.

Melilotus officinalis Willd. Not seen.

(To be continued.)

A SYNOPSIS OF THE GENUS *SELAGINELLA.*

By J. G. Baker, F.R.S., &c.

(Continued from p. 25.)

220. S. pentagona Spring Mon. ii. 150. — *S. implexa* Scott. — Stems 1–$1\frac{1}{2}$ ft. long, ascending from a decumbent base, sometimes lengthened out and taking root at the tip, simple in lower half or third, deltoid and decompound upwards, with 2–3-pinnate deltoid lower pinnæ, the contiguous ascending final branchlets $\frac{1}{4}$–1 in. long, $\frac{1}{8}$–$\frac{1}{6}$ in. broad. Leaves of the lower plane contiguous, ascending, oblique ovate, acute, 1-12th to 1-8th in. long, bright green, moderately firm in texture, dilated, obscurely ciliated, broadly rounded, and much imbricated over the stem on the upper side at the base; leaves of the lower plane one-third to one-quarter as long, oblong-lanceolate, acute. Spikes square, short, $\frac{1}{2}$–$\frac{3}{4}$ lin. diam.; bracts ovate-lanceolate, strongly keeled,

Hab. Eastern Himalayas, and Parasnath. Intermediate in habit between *flabellata* and *monospora.*

221. S. Menziesii Spring Mon. ii. 185. — *S. Springii* Spring Mon. ii. 184.—*Lycopodium Menziesii* Hook. & Grev.—*L. Arbuscula* Hook. & Grev. Ic. t. 200, non Kaulf. — Stems erect, $\frac{1}{2}$–1 ft. long, simple in the lower half, with the leaves of the upper part spreading, deltoid and decompound in the upper half, the lower pinnæ copiously compound, the final branchlets $\frac{1}{4}$–$\frac{3}{4}$ in. long, $\frac{1}{6}$ in. broad. Leaves of the lower plane contiguous, oblique ovate, acute, ascending, falcate, 1-12th to 1-6th in. long, bright green, moderately firm in texture, dilated, broadly rounded, obscurely ciliated, and a little imbricated over the stem on the upper side at the base; leaves of the upper plane one-third as long, oblique ovate, with a large cusp. Spikes short, square, $\frac{3}{4}$ lin. diam.; bracts ovate-cuspidate, acutely keeled.

Hab. Polynesia, especially in the Sandwich Islands. I find it difficult to draw the line between this species and *S. Arbuscula* on the one hand, and *S. flabellata* on the other.

222. **S. breynioides,** n. sp. — Stems above a foot long, erect, simple in lower part, with spreading leaves, deltoid and decompound in the upper three-quarters, the branches erecto-patent and sparingly subflabellately compound, the lower ones half a foot long, the final branchlets 1–2 in. long, $\frac{1}{4}$–$\frac{1}{3}$ in. broad. Leaves of the lower plane contiguous even on the main stem, spreading, oblong-rhomboid, obtuse, bright green, moderately firm in texture, $\frac{1}{6}$–$\frac{1}{4}$ in. long, obliquely inserted, broadly rounded, not ciliated, slightly imbricated over the stem on the upper side at the base; leaves of the upper plane half as long, oblique ovate, with a lárge cusp, much imbricated. Spikes short, terminal, 1 lin. diam.; bracts ovate-lanceolate, acutely keeled.

Hab. Mountains of Navite, Levu, Fiji, *Milne* 198! 334! Leaves of both planes in size, shape and insertion closely resembling those of *S. Breynii*, but general habit of course very different.

serrulate, and imbricated over the stem on the upper side at the base; leaves of the upper plane minute, obovate, with a large cusp. Spikes square, $\frac{1}{4}$–$\frac{1}{2}$ in. long, $\frac{1}{2}$ lin. diam.; bracts ovate-cuspidate, strongly keeled.

p. 25

[illegible]

Hab. Mountains of Mergui, *Griffith*!

223. **S. obesa**, n. sp. — Stems erect, stramineous, under a foot long, the lower third simple, the upper two-thirds deltoid, frond-like, decompound, the close primary pinnæ lanceolate, copiously pinnate, with short sparingly compound ascending branchlets, the ultimate divisions $\frac{1}{4}$–$\frac{1}{2}$ in. long, $\frac{1}{8}$ in. broad. Leaves of the lower plane contiguous and patent on the branches, ascending on the branchlets, oblique ovate, obtuse, 1-12th to 1-8th in. long, very broad at the base, much dilated on the upper side, where it is broadly rounded, obscurely ciliated and much imbricated over the stem, the margins above the dilated base revolute; leaves of the upper plane half as long, ovate-lancealate, with a distinct cusp. Spikes short, square, $\frac{1}{2}$ lin. diam.; bracts ovate-lanceolate, strongly keeled.

Hab. North Borneo, *Burbidge*!

224. S. FULCRATA Spring Mon. ii. 171. — *S. pubescens* Spring Mon. ii. 173.—*Lycopodium fulcratum* Hamilt.—*L. pubescens* Wall.— Stems $1\frac{1}{2}$–2 ft. long, stiffly erect, simple in the lower half, with a few distant small adpressed leaves, deltoid and decompound in the upper half, the pinnæ deltoid, the lower ones 3–4-pinnate, the rachises pubescent, the final branchlets contiguous, $\frac{1}{4}$–$\frac{1}{2}$ in. long, 1-12th to 1-8th in. diam. Leaves of the lower plane rather spaced even on the branchlets, ascending, lanceolate, acute, 1-12th to 1-8th in, long, bright green, liable to be revolute at both margins, nearly equal-sided, truncate, and not at all imbricated over the stem at the base; leaves of the upper plane half as long, lanceolate, incurved, not cuspidate. Spikes square, $\frac{1}{4}$–$\frac{1}{2}$ in. long, $\frac{1}{2}$ lin. diam.; bracts orbicular, with a small cusp, little longer than the sporangia.

Hab. East Himalayas, and mountains of Birma. A well-marked species, allied only to the African *S. Vogelii*.

225. S. GRANDIS Moore in Gard. Chron. 1882, vol. ii. p. 40, t. 8. —*S. platyphylla* Hort. Veitch. — Stems erect, $1\frac{1}{2}$–2 ft. long, simple in the lower half, deltoid and decompound in the upper half, the branching midway between flabellate and pinnate, the contiguous final branchlets $\frac{2}{3}$ in. broad. Leaves of the lower plane crowded, lanceolate, very acute, $\frac{1}{4}$–$\frac{1}{3}$ in. long, bright green, moderately firm in texture, equilateral except at the base, where they are more rounded on the anterior side, slightly ciliated on both margins; leaves of the lower plane one-third as long, obtuse, ovate-lanceolate, very acute, ascending, much imbricated. Spikes copious, square, tetragonal, 1–$1\frac{1}{2}$ in. long, 1-12th to 1-8th in. diam.; bracts ovate-lanceolate, strongly ciliated.

Hab. Borneo, *Curtis*! A very fine plant, recently introduced into cultivation by Messrs. Veitch.

226. S, LATIFOLIA Spring Mon. ii. 168. — *Lycopodium latifolium* Hook. & Grev. — Stems erect, 1–$1\frac{1}{2}$ ft. long, simple in the lower half, deltoid and decompound in the upper half, the branching

midway between flabellate and pinnate, the final branchlets reaching a length of 3–4 in., $\frac{1}{4}$–$\frac{1}{3}$ in. broad. Leaves of the lower plane contiguous, oblong-rhomboid, ascending, falcate, subacute at the upper corner, 1-6th to 1-5th in. long, dark green, moderately firm in texture, very unequal-sided, broadly rounded, not ciliated, and hardly at all imbricated over the stem on the upper side at the base; leaves of the upper plane one-third as long, broad-ovate, with a large cusp. Spikes square, $\frac{1}{2}$–1 in. long, 1-12th to 1-8th in. diam.; bracts ovate-lanceolate, strongly keeled.

Hab. Ceylon, New Guinea, Samoa, Fiji.

227. S. FLABELLATA Spring Mon. ii. 174.—*S. subsplendens* Presl. —*S. undulata* Liebm. — *Lycopodium flabellatum* Linn. — *L. penniforme* Lam. — *L. gracile* and *microstachyum* Desv. — Stems 1–2 ft. long, erect, simple in the lower half, deltoid and decompound in the upper half, the pinnæ deltoid, the lower 3–4-pinnate, the contiguous final branchlets $\frac{1}{4}$–1 in. long, $\frac{1}{8}$–$\frac{1}{6}$ in. broad. Leaves of the lower plane contiguous, oblique ovate, acute, ascending, bright green, moderately firm in texture, obliquely inserted, much dilated, broadly rounded, ciliated, and much imbricated over the stem on the upper side at the base; leaves of the upper plane one-quarter to one-third as long, oblique ovate, cuspidate. Spikes square, $\frac{1}{2}$–1 in. long, $\frac{3}{4}$–$\frac{1}{2}$ lin. diam.; bracts ovate-cuspidate, strongly keeled.

Hab. Universal in the tropical and subtropical regions of America, Asia, and Polynesia.

228. S. FIRMULA A. Br.; Kuhn Fil. Nov. Hebrid. 17. — Stems above a foot long, stiffly erect, simple in the lower half, with distant adpressed leaves, deltoid and decompound in the upper half, the pinnæ ascending, deltoid, the lower 3–4-pinnate, the final branchlets contiguous. $\frac{1}{4}$–$\frac{1}{2}$ in. long, 1 lin. broad. Leaves of the lower plane crowded on the branchlets, ascending, oblique ovate, 1-12th to 1-8th in. long, dark green, rather firm in texture, produced, broadly rounded and strongly ciliated on the upper side at the base, and imbricated over the stem; leaves of the upper plane half as long, oblique ovate, cuspidate. Spikes very copious, $\frac{1}{2}$–1 in. long, $\frac{3}{4}$ lin. diam., square; bracts nearly uniform. erecto-patent, ovate-lanceolate, strongly keeled, the sporangia confined to the axils of those of the lower plane, which are consequently more ventricose at the base.

Hab. Aneiteum, *Milne*! *J. G. Veitch*! Ovalau and Angau, Fiji, *Milne* 345! Habit entirely of *S. flabellata*.

229. **S. hordeiformis**, n. sp. — Stems 2 ft. long, erect, simple in the lower half, deltoid and decompound in the upper half, the lower pinnæ deltoid and 3–4-pinnate, the contiguous final branchlets $\frac{1}{4}$–$\frac{3}{4}$ in. long, under $\frac{1}{4}$ in. broad. Leaves of the lower plane contiguous, spreading, oblong- or ovate-rhomboid, pointed at the upper corner, $\frac{1}{6}$–$\frac{1}{4}$ in. long, bright green, firm in texture, obliquely inserted, broadly rounded, serrulate, but little imbricated over the stem on the upper side at the base; leaves of the upper plane oblong, with a cusp as long as the lamina. Spikes copious, square, $\frac{1}{4}$–$\frac{1}{2}$ in. long, $\frac{1}{8}$ in. diam.; bracts ovate, narrowed into a very large awn-like cusp.

Hab. Fiji Islands, *Macleay*!

230. **S. nitens,** n. sp.—Stems about a foot long, simple in the lower half, the leaves of its upper part spreading, deltoid and decompound in the upper half, the close pinnæ deltoid, the lower 3–4-pinnate, the erecto-patent contiguous final divisions $\frac{1}{4}$–$\frac{1}{2}$ in. long, $\frac{1}{6}$ in. broad. Leaves of the lower plane contiguous and ascending on the branchlets, spreading on the rachis and pinnæ, deflexed and spaced on the main stem, oblong-lanceolate, acute, bright dark green, moderately firm in texture, $\frac{1}{8}$–$\frac{1}{6}$ in. long, rather dilated, serrulate, and a little imbricated over the stem on the upper side at the base; leaves of the upper plane small, oblique obovate, with a large cusp. Spikes short, terminal, square, $\frac{3}{4}$ line diam.; bracts ovate-lanceolate, acuminate.

Hab. Fernando Po, *Mann*! Cameroon Mountains, *Kalbreyer*! A near ally of *S. flabellata.*

231. S. FRUTICULOSA Spring in Bot. Zeit. 1838, 202. — *S. tereticaulis*, *membranacea*, *deliquescens*, *falcata*, and *cataphracta* Spring Mon. ii. 158–182. — *Lycopodium fruticulosum* Bory. — *L. membranaceum*, *falcatum*, and *tereticaulon* Desv. — Stems 1–2 ft. long, erect, simple in the lower half or third with a few distant adpressed deciduous leaves, deltoid and decompound upwards, the branching midway between pinnate and flabellate, the lower pinnæ often petioled, the erecto-patent final divisions $\frac{1}{2}$–1 in. long, $\frac{1}{6}$–$\frac{1}{4}$ in. broad. Leaves of the lower plane contiguous, rather ascending, oblong-lanceolate, falcate, acute, bright green, firm in texture, $\frac{1}{8}$–$\frac{1}{6}$ in. long, rather unequal-sided, rounded, shortly ciliated, and a little imbricated over the stem on the upper side at the base; leaves of the upper plane minute, oblique ovate, cuspidate. Spikes short, square, $\frac{1}{2}$ lin. diam.; bracts ovate-cuspidate, strongly keeled.

Hab. Mountains of Mauritius, Bourbon, and Madagascar. I have failed to draw any clear line between Spring's five species above cited.

232. S. VOGELII Spring Mon. ii. 169; Hook. 2 Cent. t. 86.—*S. Pervillei* Spring. — *S. africana* and *eublepharis* A. Br. — Stems 1–2 ft. long, erect, simple in the lower half, often pink-tinted, with a few distant small adpressed leaves, deltoid and decompound in the upper half, the lower pinnæ deltoid, petioled, 3–4-pinnate, the contiguous erecto-patent final divisions $\frac{1}{4}$–$\frac{3}{4}$ in. long, $\frac{1}{8}$ in. broad. Leaves of the lower plane spaced even on the branchlets, lanceolate or oblong-lanceolate, ascending, acute, 1-12th to 1-6th in. long, bright green, both edges liable to be revolute, truncate at the base, inserted on the side of the stem, not at all imbricated over the pubescent branches; leaves of the upper plane minute, oblique ovate, with a large cusp. Spikes square, $\frac{1}{4}$–$\frac{1}{2}$ in. long, $\frac{1}{2}$ lin. diam.; bracts ovate-cuspidate, strongly keeled.

Hab. Guinea Coast, Cameroon Mountains, Zanzibar, Madagascar. A near ally of the Himalayan *S. fulcrata.* Well known in cultivation.

(To be continued.)

SHORT NOTES.

A Correction.—The *Potamogeton* of the River Barrow, which I named doubtfully *P. rufescens* (ante, p. 12), is determined by Mr. Arthur Bennett (to whom I sent specimens) to be *P. nitens* Web.. var. *latifolius* Fr. *P. nitens* must be a very variable plant, as Mr, Bennett tells me he has no fewer than twenty-six forms in his herbarium.—H. C. Hart.

Lysimachia ciliata in North Wales.—I found this plant last September, among some bushes at the western end of a small lake (the easternmost of two), near Afon-Wen, not far from the railway-station. Mr. Baker has seen my specimens.—H. C. Levinge.

Carex aquatilis in Ireland.—We have still another instance of a high northern plant occurring at a low level in Ireland. Whilst doing the required field-work to enable me to make a report to the Royal Irish Academy, on the botany of Lough Allen, a sedge was met with whose aspect differed from anything I had hitherto seen, and which I thought, at the time, might be a variety of *C. stricta.* Subsequently it was named by a Continental authority as *C. acuta* var. *gracilis* Uechtritz. A specimen was sent to Mr. Bennett, of Croydon, and that gentleman, with his usual acuteness, saw cause to be dissatisfied with the name attached, and sent the plant to Sweden, to be compared with specimens in Fries's herbarium. Dr. Almquist, who made the comparison, reports that our sedge is not *C. gracilis*, but *C. aquatilis* Wahl. In attempting to place my plant under *C. stricta*, or *C. acuta*, I had never taken *C. aquatilis* into consideration, as, for geographical reasons, that species seemed altogether out of the field; nevertheless it is quite apparent when pointed out. I may add that Mr. A. G. More, the recognised head of Irish botanists, has seen a specimen, and concurs in the determination. *C. aquatilis* grows near Drumshambo, in a swampy thicket on that part of the shore of Lough Allen which lies in the County Roscommon. I saw three or four tufts, each bearing several flowering stems, two or three feet high. Some stems were too far advanced, but the majority were in excellent condition for diagnosis. The district, as regards rare plants, proved unusually poor, but the flora of Ben Bulben, some 25 miles north, presents the greatest assemblage of alpine and sub-alpine plants in Ireland. The discovery of this sedge is associated in my memory with mournful recollections. It was found on the 9th August, 1883, the same day and about the same hour when two young and ardent naturalists were being drowned, while botanising on Lough Gill, in the adjoining county of Sligo. The furious gusts of wind and rain which drove me to seek the most sheltered spots, and thus compelled me to meet with this plant, were at the same time doing to death my young friend Corry, with his bright promise of future distinction, and his equally enthusiastic companion, Dickson.—S. A. Stewart.

Heterostyled Plants.—The fact that, among the English members of the genus *Primula*, the long-styled plants are, on an average, decidedly more numerous than the short-styled plants (*vide* Trans. Essex Field Club, vol. iii., p. 157), naturally suggests the question, Does this fecundity extend to other dimorphic and trimorphic heterostyled species? Not being aware of any observations bearing upon the subject, I have lately seized such opportunities as have presented themselves for examining heterostyled species, in order to endeavour to throw some light upon the matter. Most of the observations given in the following table were made whilst travelling in the United States of Canada, twice when engines had broken down, and once whilst waiting for a train. Observation No. 1 was made by Mr. John Gibbs, of Chelmsford (Proc. Essex Field Club, vol. ii., p. 6); the observations combined to form No. 9 were made by my friend, Mr. Ernest E. T. Seton, of Toronto. The only conclusion that can be safely drawn from an examination of the tabular statement is that, so far as the details contained in it are concerned, no general statement can be made as to the preponderance of either one form or the other in the species already examined.

No. of Observations.	Species.	No. of plants examined.	Long-styled.	Short-styled.	Mid-styled.	Majority for		Date.	Locality.
						Longs.	Shorts.		
1.	Lythrum salicaria	33	12	5	16	—	—	Aug. 29, '81	Chelmsford.
2.	Do.	37	13	13	11	—	—	Aug. 30, '84	Do.
3.	Oxalis violacea	31	17	14	—	3	—	May 29, '84	Ramsey, Minn.
4.	Do.	26	12	14	—	—	2	June 14, '84	Near the Falls of Minnehaha.
5.	Lithospermum canescens	57	33	24	—	9	—	May 29, '84	Ramsey, Minn,
6.	Do.	41	23	18	—	5	—	May 30, '84	RedWing, Minn.
7.	Do.	17	7	10	—	—	3	June 14, '84	Near the Falls of Minnehana.
8.	Do.	67	32	35	—	—	3	June 20, '84	Manitou, Man.
9.	Do.	284*	133	151	—	—	18	May 29, '84 to June 30, 84	Manitoba.
10.	L. hirsutum	62	32	30	—	2	—	June 14, '84	Prairie, nr. Falls of Minnehaha.
11.	Do.	51	26	25	—	1	—	Do.	Do.

* This is the total result of eight different observations made around and between Fort Pelly, N.W.T., and Carberry, Manitoba.

ROBT. MILLER CHRISTY.

NEW BRITISH AND IRISH CARICES.—1. CAREX SALINA Wahlenberg β. *Kattegatensis* Fries (sp.)! Caithness, Scotland, August, 1883, *J. Grant*, who writes that it is plentiful.—2. C. STRICTA Good., var. *turfosa* Fries (sp.)! Cambridgeshire, *Fryer*, 1884.—3. C. ACUTA L. var. *prolixa* Fries (sp.). Norfolk, *J. Priest*, 1844, from *H. G. Glasspoole*.—4. C. ACUTA L., var. *gracilescens* Almquist! Shropshire, *W. E. Beckwith*, 1884; Cambridgeshire, *Fryer*, 1884.—5. C. GOODENOVII Gay, var. *juncella* Fr. Surrey, *W. H. Beeby* and *A. Bennett!*; North Lincoln, *H. Searle*, 1882!; Warwick, J. E.

Bagnall; Isle of Skye, *W. R. & E. L. Linton!*. — 6. C. VESICARIA L., var. *diochroa* Anderss. Ben Lawers, Perth, *G. C. Druce*.— *C. Goodenovii juncella* has of course been recorded, but with some uncertainty. In the cases of those Carices, where a mark ! is given, it is with the determination of Dr. Almquist, of Stockholm, or the names have been assented to by him. In the other cases the specimens have been compared with the types of Fries and Andersson.—ARTHUR BENNETT.

CAREX LIGERICA Gay IN WEST NORFOLK.—Subsequent to finding this plant at Castle Rising, in West Norfolk, as recorded in the 'Journal of Botany' for July last, I also found it growing sparingly in the adjoining parishes of North Wooten and Sandringham. The former is about a mile west, and the latter three miles north, of the Castle Rising locality, where it was growing somewhat plentifully. I also searched the coast-line in several places, but did not find it.—ALFRED BALDING.

NEW PHANEROGAMS PUBLISHED IN PERIODICALS IN BRITAIN DURING 1884.

THE periodicals cited in this list are: 'Botanical Magazine,' 'Gardeners' Chronicle,' 'Icones Plantarum,' 'Journal of Botany,' and the 'Journal' and 'Transactions' of the Linnean Society of London.

We have added in square brackets the publishers of certain names which are cited from the MS. description or notes of those who stand as the authority for them—*e.g.*, *Cyperus actinostachys* was so named in MS. by Welwitsch, but the publication of the name is due to Mr. Ridley; we therefore print it *Cyperus actinostachys* Welw. MSS. [Ridley]. *Primula dolomitis* Hort. Llewelyn stands as *Primula dolomitis* Hort. Llewelyn [Baker]; in this case we imagine all will agree in quoting the plant as *P. dolomitis* Baker, although in the preceding instance there may be a difference of opinion. New genera are indicated by a prefixed asterisk.

ACER FABRI *Hance*. China. Journ. Bot. 76.

AERIDES ROEBELENII *Rchb. f.* Philippines. Gard. Chron. xxi. 510. — A. ROHANIANUM *Rchb. f.* E. Asia. Id. xxi. 206. — A. SANDERIANUM *Rchb. f.* Id. xxii. 134.

AGROSTIS SIMULANS *Hemsl.* St. Helena. Ic. Plant. t. 1455.

ALBUCA YERBURYI *Ridley*. Aden. Journ. Bot. 370.

ALEPIDEA WOODII *Oliv.* Natal. Ic. Plant. 1452.

ALOE CRYPTOPODA *Baker*. Zambesi. Journ. Bot. 52.

AMMANNIA CRYPTANTHA *Baker*. Madagascar. Journ. Linn. Soc. xxi. 345.

ANTHOPTERIS WARDII *Ball*. Columbia. Ic. Plant. t. 1465.

APONOGETON HOLUBII *Oliv.* Bechuana Country. Ic. Plant. i. 1470. — A. NATALENSE *Oliv.* Natal. Id. t. 1471. — A. REHMANNII *Oliv.* Transvaal. Id.

Ardisia mamillata *Hance.* China. Journ. Bot. 290.

Arisæma fimbriatum *Mast.* Philippines. Gard. Chron. xxii. 681, fig. 119.

Ascolepis pusilla *Ridley.* W. Trop. Africa. Trans. Linn. Soc. 2nd S. ii. 164, t. 23.

Barkeria Barkeriola *Rchb. f.* Gard. Chron. xxii. 616.

Begonia Beddomei *Hook. f.* Assam. Bot. Mag. t. 6767. — B. heteropoda *Baker.* Madagascar. Journ. Linn. Soc. xxi. 347. — B. Lyncheana *Hook. f.* Mexico. Bot. Mag. t. 6758.

Beschorneria Decosteriana, *Hort. Leichtlin,* [*Baker.*] Bot. Mag. t. 6768.

Bravoa Bulliana *Baker.* S. America. Gard. Chron. xxii. 328.

Bulbophyllum Sillemianum *Rchb. f.* Birma. Gard. Chron. xxii. 166.

Cæsalpinia minax *Hance.* China. Journ. Bot. 365.

Calanthe Curtisii *Rchb. f.* Sunda. Gard. Chron. xxii. 262. — C. dipteryx *Rchb. f.* Sunda. Id. xxii. 394. — C. proboscidea *Rchb. f.* Sunda Islands. Id. xxi. 476.

Caraguata angustifolia *Baker.* N. Granada. Gard. Chron. xxii. 616.

Carionia triplinervia *Rolfe.* Philippines. Journ. Linn. Soc. xxi. 310.

Carmichaelia Enysii *T. Kirk.* N. Zealand. Gard. Chron. xxi. 512. — C. uniflora *T. Kirk.* Id.

Castanopsis Fabri *Hance,* C. Fordii *Hance,* and C. jucunda *Hance.* China. Journ. Bot. 230.

Chuquiraga Kingii *Bull.* Patagonia. Journ. Linn. Soc. xxi 225.

Cleisostoma formosanum *Hance.* Formosa. Journ. Bot. 364.

Clematis edentata *Baker.* Journ. Linn. Soc. xxi. 318. — C. laxiflora *Baker.* Id. 317. — C. microcuspis *Baker.* Id. 317. All from Madagascar.

Clerodendron illustre *N. E. Br.* Celebes. Gard. Chron. xxii. 424.

Coelogyne Dayana *Rchb. f.* Borneo. Gard. Chron. xxi. 826. —C. Rossiana *Rchb. f.* Birma. Id. xxii. 808.

Cordia pedicellata *Baker.* Madagascar. Journ. Linn. Soc. xxi. 338.

* Creaghia fagræaopsis *Scortechini* (Rubiaceæ Cinchoneæ). Malaya. Journ. Bot. 370.

Crinum leucophyllum *Baker.* Dammara-land. Bot. Mag. t. 6783. C. Sanderianum *Baker.* Sierra Leone. Gard. Chron. xxii. 102.

Cuphocarpus inermis *Baker.* Madagascar. Journ. Linn. Soc. xxi. 350.

Cyperus actinostachys *Welw. MSS* [*Ridl.*]. Trans. Linn. Soc. 2nd S. ii. 140.—C. æthiops *Welw. MSS.* [*Ridl.*]. Id. 129.—C. albiceps *Ridl.* Trop. Africa. Journ. Bot. 16.—C. andongensis *Ridl.* Trans. Linn. Soc. 2nd S. ii. 140.—C. apricus *Ridl.* Id. 141.—C. argenteus *Ridl.* Id. 133. — C. argentinus *Clarke.* Argentine Republic. Journ. Linn. Soc. xxi. 64. — C. Atkinsoni *Clarke.* India. Id. 109.—C. atractocarpus *Ridl.* Trans. Linn. Soc. 2nd S. ii. 141.—C. benghalensis *Clarke.* Journ. Linn. Soc. xxi. 151.

C. CALLISTUS *Ridl.* W. Trop. Africa. Trans. Linn. Soc. 2nd S. ii. 143. — C. CANCELLATUS *Ridl.*. Id. 131. — C. CUAZENSIS *Ridl.* Id. 128. — C. DAPHÆNUS *Ridl.* Madagascar. Journ. Bot. 16. — C. DIVULSUS *Ridl.* Madagascar. Id. 15. — C. EURYSTACHYS *Ridl.* Trans. Linn. Soc. 2nd S. ii. 143. — C. FLUMINALIS *Ridl.* Id. 127. — C. FULVUS *Ridl.* Id. 126. — C. GRACILINUX *Clarke.* Central Africa. Journ. Linn. Soc. xxi. 162. — C. HUILLENSIS *Ridl.* Trans. Linn. Soc. 2nd S. 139. — C. HYLÆUS *Ridl.* Id. 134. — C. LANCEOLA *Ridl.* Id. 134. — C. MELAS *Ridl.* Id. 127. — C. MYRMECIAS *Ridl.* Id. 144. — C. PEDUNCULOSUS *F. Muell. MS.* [*Clarke*], Australia. Journ. Linn Soc. xxi. 131.— C. PELOPHILUS *Ridl.* Trans. Linn. Soc. 2nd S. ii. 129. — C. SABULICOLUS *Ridl.* Id. 136. — C. SMITHIANUS *Ridl.* Trop. Africa. Journ. Bot. 15. — C. SULCINUX *Clarke.* Asia. Journ. Lin. Soc. xxi. 56. — C. SYLVESTRIS *Ridl.* Trans. Linn. Soc. 2nd S. ii. 134. — C. TANYPHYLLUS *Ridl.* Id. 143. The species in Trans. Linn. Soc. are all from W. Trop. Africa.

DALBERGIA BARONI *Baker.* Madagascar. Journ. Linn, Soc. xxi. 337.

DENDROBIUM CRUENTUM *Rchb. f.* Gard. Chron. xxi. 604. — D. DACTYLIFERUM *Rchb. f.* Id. xxi. 638. — D. PROFUSUM *Rchb. f.* Philippines. Id. xxi. 510. — D. SIGNATUM *Rchb. f.* Siam. Id. xxi. 306. — D. VEXABILE *Rchb. f.* "n. sp. (?) hyb. nat." Id. xxi. 270. — D. VIRGINEUM *Rchb. f.* Birma. Id. xxii. 520.

DENDROCHILUM CUCUMERINUM *Rchb. f.* Gard. Chron. xxii. 649.

DESMOSTACHYS ACUMINATA *Baker*, and D. DELTOIDEA *Baker.* Madagascar. Journ. Linn. Soc. xxi. 332.

DICOMA ARGYROPHYLLA *Oliv.* Natal. Ic. Plant. t. 1461.

DILLENIA PHILIPPINENSIS *Rolfe.* Philippines. Journ. Soc. xxi. 307.

DOMBEYA FLORIBUNDA *Baker.* Journ. Linn. Soc. xxi. 325. — D. MACRANTHA *Baker.* Id. — D. REPANDA *Baker.* Id. 326. All from Madagascar.

DRYMONIA MARMORATA, *Hort. Bull.* [*Hook. f.*] Trop. America. Bot. Mag. t. 6763.

DYCKIA LEPTOSTACHYA *Baker.* Paraguay. Gard. Chron. xxii. 198.

ECHINOCARPUS SINENSIS *Hance.* China. Journ. Bot. 108.

ELÆODENDRON GRISEUM *Baker.* Journ. Linn. Soc. xxi. 333. — E. NITIDULUM *Baker.* Id. 332. — E. TRACHYCLADUM *Baker.* Id. — E. VACCINIOIDES *Baker.* Id. All from Madagascar.

*EOMECON CHIONANTHA *Hance* (Papaveraceæ). China. Journ. Bot. 346.

EPIDENDRUM CHRISTYANUM *Rchb. f.* Bolivia. Gard. Chron. xxii. 38.

EPILOBIUM OLIGANTHUM *Baker.* Madagascar. Journ. Linn. Soc. xxi. 345.

ERIA BIGIBBA *Rchb. f.* Borneo. Gard. Chron. xxii. 681.

ERYTHOXYLUM FIRMUM *Baker.* Madagascar. Journ. Linn. Soc. xxi. 327.

EUGENIA LOISELEURIOIDES *Baker.* Madagascar. Journ. Linn. Soc. xxi. 341.

EUPATORIUM BALLII *Oliv.* Peruvian Andes. Ic. Plant. t. 1462.

FIMBRISTYLIS APHYLLANTHOIDES *Welw. MS.* [*Ridley*]. Trans. Linn. Soc. 2nd S. ii. 155. — F. CARDIOCARPA *Ridl.* Id. 154. — F.

collina *Ridl.* Id. 154. — F. flexuosa *Ridl.* Id. 155. — F. huillensis *Ridl.* Id. 154. — F. macra *Ridl.* Id. 150. — F. megastachys *Ridl.* Id. 156. — F. melanocephala *Ridl.* Id. 156. F. oritrephes *Ridl.* Id. 155. — F. parva *Ridl.* Id. 153. — F. quaternella *Ridl.* Id. 152.

Fuirena chlorocarpa *Ridl.* Africa. Trans. Linn. Soc. 2nd S. ii. 169. — F. pachyrhiza *Ridl.* W. Trop. Africa. Id. 161. — F. pygmæa *Welw. MS.* [*Ridley*]. Id. 160. — F. Welwitschii *Ridl.* Id. 161.

Galium cryptanthum *Hemsl.* Himalaya. Ic. Plant. t. 1469.

Gastonia emirnensis *Baker.* Madagascar. Journ. Linn. Soc. xxi. 350.

Gleditschia xylocarpa *Hance.* China. Journ. Bot. 366.

Gomphia anceps *Baker*, G. lanceolata *Baker*, and G. perseæfolia *Baker.* Madagascar. Journ. Linn. Soc. xxi. 330.

Gomphostemma chinense *Oliv.* China. Ic. Plant. t. 1468. — G. insuave *Hance.* China. Journ. Bot. 231.

Gomphostigma incanum *Oliv.* S. Africa. Ic. Plant. t. 1462.

Grewia cuneifolia *Baker*, and G. macrophylla *Baker.* Madagascar. Journ. Linn. Soc. xxi. 326.

Gymnocladus Williamsii *Hance.* China. Journ. Bot. 366.

Heleocharis anceps *Ridl.* W. Trop. Africa. Trans. Linn. Soc. 2nd S. ii. 148,

Hibiscus palmatifidus *Baker.* Madagascar. Journ. Linn. Soc. xxi. 324.

*Holubia saccata *Oliv.* (Pedalineæ). Transvaal. Ic. Plant. t. 1475.

Homalium confertum *Baker.* Madagascar. Journ. Linn. Soc. xxi. 341.

*Hyalocalyx setiferus *Rolfe* (Turneraceæ). Madagascar. Journ. Linn. Soc. xxi. 258.

Hydrocotyle filicaulis *Baker*, and H. superposita *Baker.* Madagascar. Journ. Linn. Soc. xxi. 348.

Hymenocallis eucharidifolia *Baker.* Gard. Chron. xxi. 700.

Ilex Cumingiana *Rolfe.* Journ. Linn. Soc. xxi. 308. — I. Lobbiana *Rolfe.* Id. 309. — I. luzonica *Rolfe.* Id. 309. — I. philippinensis *Rolfe.* Id. 308. All from the Philippines.

Ipomæa Shirensis *Oliv.* Zambesi. Ic. Plant. t. 1474.

Ismene Andreana *Baker.* Ecuador. Gard. Chron. xxi. 11.; Garden, May 31 (ic. pict.).

Kitchingia schizophylla *Baker.* Madagascar. Journ. Linn. Soc. xxi. 340.

Kyllinga aromatica *Ridl.* Trans. Linn. Soc. 2nd S. ii. 146. — K. pauciflora *Ridl.* Id. 147, t. 23. — K. Welwitschii *Ridl.* Id. 147. All from W. Trop. Africa.

Lachenalia fistulosa *Baker.* Cape. Gard. Chron. xxi. 669.—L. lilacina *Baker.* Id. — L. odoratissima *Baker.* Id.

Lantana Clarazii *Bull.* Patagonia. Journ. Linn. Soc. xxi. 229.

Liparis decursiva *Rchb. f.* India. Gard. Chron. xxii. 38. — L. grandiflora *Ridl.* Borneo. Journ. Bot. 333.

Lipocarpha albiceps *Ridl.* Trans. Linn. Soc. 2nd. S. ii. 163. —L.

atra *Ridl.* Id. 162 — L. pulcherrima *Ridl.* Id. 162. — L. purpureo-lutea *Ridl.* Id. 163. All from W. Trop. Africa.

Lophiocarpus tenuissimus *Hook. f.* Transvaal. Ic. Plant. t. 1463.

Loranthus rubroviridis *Oliv.* Zambesi. Ic. Plant. t. 1464.

Lycium Wilkesii *Ball.* Patagonia. Journ. Linn. Soc. xxi. 229.

Margyricarpus Clarazii *Ball.* Patagonia. Journ. Linn. Soc. xxi. 217.

Masdevallia anchorifera *Rchb. f.* Costa Rica. Gard. Chron. xxi. 577. — M. flaveola *Rchb. f.* Costa Rica. Id. xxi. 638. — M. Mooreana *Rchb. f.* Id. xxi. 408. — M. pachyantha *Rchb. f.* N. Granada. Id. xxi. 174.

*Melanophylla alnifolia *Baker* (Cornaceæ). Journ. Linn. Soc. xxi. 352.—M. aucubæfolia *Baker.* Id. 353. Both from Madagascar.

Mimosa myriacantha *Baker.* Journ. Linn. Soc. 339. — M. dasyphylla *Baker.* Id. 338. Both from Madagascar.

Medinilla lanceolata *Baker.* Journ. Linn. Soc. xxi. 344. — M. leptophylla *Baker.* Id. 343. — M. lophoclada *Baker.* Id. 344. All from Madagascar.

Melothria emirnensis *Baker.* Madagascar. Journ. Linn. Soc. xxi. 346.

Memecylon oleæfolium *Baker.* Madagascar. Journ. Linn. Soc. xxi. 343.

Modecca peltata *Baker.* Madagascar. Journ. Linn. Soc. xxi. 345.

Myrica Vidaliana *Rolfe.* Philippines. Journ. Linn. Soc. xxi. 316.

Myriophyllum axilliflorum *Baker.* Madagascar. Journ. Linn. Soc. xxi. 340.

*Neobaronia phyllanthoides *Baker* (Leguminosæ, Dalbergieæ). Madagascar. Journ. Linn. Soc. xxi. 337.

Nepenthes cincta *Mast.* Borneo. Gard. Chron. xxi. 576 (fig. 110).

*Northea Seychellana *Hook. f.* (Sapotaceæ) (Mimusops? Horneana *Hartog*). Seychelles. Ic. Plant. t. 1473.

Ochna serratifolia *Baker*, and O. vaccinioides *Baker.* Madagascar. Journ. Linn. Soc. xxi. 329.

Odontoglossum Dormianum *Rchb. f.* Columbia. Gard. Chron. xxi. 11. — O. ioplocon *Rchb. f.* Id. xxi. 445.

Olax emirnensis *Baker.* Madagascar. Journ. Linn. Soc. xxi. 331.

Olearia macrodonta *Baker.* (O. dentata *Hook. f.* non Mœnch). N. Zealand. Gard. Chron. xxi. 604.

Oncidium aurarium *Rchb. f.* Bolivia. Gard. Chron. xxii. 394. — O. endocharis *Rchb. f.* Id. xxi. 206.—O. tricuspidatum *Rchb. f.* Id. xxii. 70.

Oncoba capreæfolia *Baker.* Madagascar. Journ. Linn. Soc. xxi. 320.

Ornithochilus eublepharon *Hance.* China. Journ. Bot. 364.

Otiophora cupheoides *N. E. Br.* Transvaal. Ic. Plant. 1453.

Oxalis macropoda *Baker.* Madagascar. Journ. Linn. Soc. xxi. 328.

Panax amplifolium *Baker.* Journ. Linn. Soc. xxi. 351. — P. confertifolium *Baker.* Id. — P. multibracteatum *Baker.* Id. — P. pentamerum *Baker.* Id. 352. All from Madagascar.

*Phellolophium madagascariense *Baker* (Umbelliferæ Seselineæ). Madagascar. Journ. Linn. Soc. xxi. 349.

*Phornothamnus thymoides *Baker* (Melastomaceæ Oxysporeæ). Madagascar. Journ. Linn. Soc. xxi. 342.

Pimpinella laxiflora *Baker*. Madagascar. Journ. Linn. Soc. xxi. 349.

Piper ornatum *N. E. Br.* Gard. Chron. xxii. 424.

Pittosporum stenopetalum *Baker*. Madagascar. Journ. Linn. Soc. xxi. 320.

Pleurothallis elachopus *Rchb. f.* Venezuela? Gard. Chron. xxi. 108.

Polyalthia lucens *Baker*. Madagascar. Journ. Linn. Soc. xxi. 318.

Polygala pilosa *Baker*. Madagascar. Journ. Linn. Soc. xxi. 321.

Primula dolomitis *Hort. Llewelyn* [*Baker*]. Tyrol. Gard. Chron. xxi. 577.

Prismatocarpus tenellus *Oliv.* Cape. Ic. Plant. t. 1460.

*Pseudocarapa Championii *Hemsl.* (Meliaceæ), (Amoora Championii *Benth. & Hook.*). Ceylon. Ic. Plant. t. 1458.

Psorospermum cerasiferum *Baker*. Journn. Linn. Soc. xxi. 324. — discolor *Baker*. Id. 323. — P. leptophyllum *Baker*. Id. — P. trichophyllum *Baker*. Id. All from Madagascar,

Pterolobium subvestitum *Hance*. China. Journ. Bot. 365.

Pyrenacantha chlorantha *Baker*. Madagascar. Journ. Linn. Soc. xxi. 331.

Quercus iteaphylla *Hance*. Journ. Bot. 229. — Q. litseifolia *Hance*. Id. 228. — Q. Naiadarum *Hance*. Id. 229. — Q. silvicolarum *Hance*. Id. 229. — Q. synbalanos *Hance*. Id. 228.— Q. uvariifolia *Hance*. Id. 227. All from China.

Rhipsalis horrida *Baker*. Madagascar. Journ. Linn. Soc. xxi. 347.

*Rhodoclada rhopaloides *Baker* (Linaceæ ?). Madagascar. Journ. Linn. Soc. xxi. 328.

Rhododendron simiarum *Hance*. China. Journ. Bot. 22. — R. Tovernæ *F. Muell.* N. Guinea. Gard. Chron. xxii. 712, fig. 127.

Rhodolæna acutifolia *Baker*. Madagascar. Journ. Linn. Soc. xxi. 322.

Rourea platysepala *Baker*. Madagascar. Journ. Linn. Soc. xxi. 336.

Rubus aralioides *Hance*. China. Journ. Bot. 41.

Saccolabium bellinum *Rchb. f.* Birma. Gard. Chron. xxi. 174.

Salacia dentata *Baker*, and S. oleoides *Baker*. Madagascar. Journ. Linn. Soc. xxi. 334.

Sarcanthus Lendyanus *Rchb. f.* Annam. Gard. Chron. xxi. 44.

Schœnus erinaceus *Ridl.* W. Trop. Africa. Trans. Linn. Soc. 2nd S. ii. 165, t. 23.

Scilla Bellii *Baker*. Laristan. Gard. Journ. xxii. 488.

Scirpus nobilis *Ridl.* Africa. Trans. Linn. Soc. 2nd S. ii. 159. — S. Rehmanni *Ridl.* Africa. Id.

Scleria cæspitosa *Welw. MSS.* [*Ridl.*]. Trans. Linn. Soc. 2nd S. ii. 167. — S. cervina *Ridl.* Id. 171. — S. dumicola *Ridl.* Id. 169.—S. erythrorhiza *Ridl.* Id. 167. — S. Hilsenbergii *Ridl.* Madagascar. Journ. Bot. 16. — S. junciformis *Welw.*

MSS. [*Ridl.*]. Trans. Linn. Soc. 2nd. S. ii. 168. — S. POŒOIDES *Ridl.* Id. 173. — S. PULCHELLA *Ridl.* Id. 168 — S. REMOTA *Ridl.* Id. 169. — S. USTULATA *Ridl.* Id. 168. All from W. Trop. Africa.

SCUTELLARIA LUZONICA *Rolfe.* Philippines. Journ. Linn. Soc. xxi. 315.

SENECIO BOLUSII *Oliv.* S. Africa. Ic. Plant. t. 1456.

SISYRINCHIUM CLARAZII *Baker.* Patagonia. Journ. Linn. Soc. xxi. 235.

SONERILA FORDII *Oliv.* China. Ic. Plant. t. 1457.

SPHACOPHYLLUM KIRKII *Oliv.* Zambesia. Ic. Plant. 1451.

*SPHÆROSEPALUM ALTERNIFOLIUM *Baker* (Guttiferæ). Madagascar. Journ. Linn. Soc. xxi. 321,

STEREOSPERMUM SEEMANNII *Rolfe.* Philippines. Journ. Linn. Soc. xxi. 314.

STIPA CLARAZII *Ball.* Patagonia. Journ. Linn. Soc. xxi. 237.

STREPTOCARPUS KIRKII *Hook. f.* Trop. Africa. Bot. Mag. t. 6782.

SYMPHONIA ACUMINATA *Baker.* Madagascar. Journ. Linn. Soc. xxi. 322.

TALAUMA VILLARIANA *Rolfe.* Philippines. Journ. Linn. Soc. xxi. 307.

TELEPHIUM MADAGASCARIENSE *Baker.* Madagascar. Journ. Linn. Soc. xxi. 347.

THYLACIUM LABURNOIDES *Baker*, and T. LAURIFOLIUM *Baker.* Madagascar. Journ. Linn. Soc. xxi. 319.

TINA POLYPHYLLA *Baker.* Madagascar. Journ. Linn. Soc. xxi. 335.

TODDALIA PILOSA *Baker.* Madagascar. Journ. Linn. Soc xxi. 329.

VEPRECELLA HISPIDA *Baker.* Madagascar. Journ. Linn Soc. xxi. 342.

VERNONIA PHILIPPINENSIS *Rolfe.* Philippines. Journ. Linn. Soc. xxi. 312.

VIBURNUM LUZONICUM *Rolfe.* Philippines. Journ. Linn. Soc. xxi. 310.

*VILLARIA PHILIPPINENSIS *Rolfe* (Rubiaceæ Gardenieæ). Philippines. Journ. Linn. Soc. xxi. 311, t. 10.

VOACANGA CUMINGIANA *Rolfe.* Philippines. Journ. Linn. Soc. xxi. 313.

WEIHEA SESSILIFLORA *Baker.* Madagascar. Journ. Linn. Soc. xxi. 341.

WEINMANNIA FRAXINIFOLIA *Baker*, and W. MINUTIFLORA *Baker.* Madagascar. Journ. Linn. Soc. xxi. 339.

NOTICES OF BOOKS.

WE have on our table several volumes which call for notice. Two or three of these we had put aside for more detailed examination than the exigencies of our space will at present permit; but it seems better to make some brief mention of them than to risk further and somewhat indefinite delay.

The Clarendon Press has issued a handsome volume on the 'Comparative Anatomy of the Vegetative Organs of the Phanerogams and Ferns,' a translation by Messrs. F. O. Bower and D. H. Scott of Prof. De Bary's important work. We hope at a future date to notice this at greater length, so will now content ourselves with this reference.

The translation of M. DeCandolle's 'Origin of Cultivated Plants,' which has been for some time anxiously looked for, has been published by Messrs. Kegan Paul, Trench, & Co. Probably no more valuable work, whether for reading or for reference, has appeared in the 'International Scientific Series,' of which it forms a volume. When noticing the original French issue (Journ. Bot. 1883, 56), we paid our tribute to the exhaustive nature of the work; it only remains to add that the English version is even more complete, being enriched with additions by the author embodying some of the information given in the valuable papers published by Drs. Asa Gray and Trumball in the 'American Journal of Science' since the issue of M. DeCandolle's volume.

Mr. Murray issues a 'Dictionary of the English Names of Plants,' compiled by Mr. William Miller. The book was originally advertised under the title of a 'Dictionary of English Plant-names,' but that title had already been employed by Messrs. Britten and Holland for their work issued by the English Dialect Society. It is perhaps not strange that such should have been the case, as the title must have been very familiar to the compiler, who has very freely availed himself of the Dialect Society's work, although he makes no reference to the source from which many of his names are taken. That this is the case can easily be shown: Mr. Miller on his first page, for example, under the heading "Adder," gives nine names, eight of which are to be found in the 'Dictionary of English Plant-names,' all of them cited or entered there on information hitherto unpublished, or quoted from out-of-the-way sources. On the same page the error by which Messrs. Britten and Holland inadvertently cited "Affadil" as an equivalent for *Narcissus Pseudo-narcissus* is unhesitatingly followed. The book is well printed and comprehensive; we have no reason to doubt the prefatory statement that it contains 15,000 names, but on what ground these are styled "English" it is not easy to understand. Under the heading "Stonecrop," for instance, are no less than fifty-three entries; but we fail to see what advantage such titles as "Ditch Stonecrop of N. America," "Ewers's Stonecrop," "Meehan's Stonecrop," "Pale rose-coloured Stonecrop," "Variegated Japanese Stonecrop," "Wightmann's Stonecrop," and the like have over their Latin equivalents.

The Society for Promoting Christian Knowledge has published a handsome volume of figures of all our British ferns, with text, under the title of 'The Fern Portfolio.' The author, Mr. F. G. Heath, has, as is well known, published several volumes on this subject, but none have seemed to us so satisfactory as the present. We think he a little over-estimates the amount of time and labour which the execution of the work has required; but he has certainly produced a volume which is likely to be useful, seeing how inexhaustible is the demand for works on this popular class of plants.

A handsome and important addition to our books on the folklore of plants is issued by Messrs. Sampson Low & Co., under the title of 'Plant Lore, Legends, and Lyrics,' by Richard Folkard, jun. The work shows very great care and industry; Mr. Folkard has appreciated at their true value the stores of information to be found in our old herbals; and his quotations from them are varied and judicious, and somewhat out of the ordinary run. His frontispiece is a good representation of that of Parkinson's 'Paradisi in Sole,' and the other illustrations are quaint and appropriate. The book is divided into two parts; the first arranged in chapters dealing with different branches of the subject, as "The World-trees of the Ancients," "The Trees of Paradise and the Tree of Adam," and so on; the second being "An Encyclopædia of Six Hundred Plants, English and Foreign, giving their Myths, Legends, Traditions, Folklore, Symbolism, and History." In this latter half much use, duly acknowledged, has been made of De Gubernatis' 'La Mythologie des Plantes.'

We have referred to the serial issue of 'The Illustrated Dictionary of Gardening' (L. Upcott Gill), the first volume (A—E) of which is now before us, bearing Mr. George Nicholson's name on its title-page. This would be a guarantee of the satisfactory quality of the work, so far as the letterpress is concerned; the engravings, too, are for the most part good, but are clearly collected from very various sources. There seems a certain want of proportion not only in the size of these, but in regard to their practical utility; for example, pp. 434–438 are mainly occupied by figures of varieties of single Dahlia. The references to published figures form a useful feature, but we regret that the abbreviations adopted are such as to necessitate constant reference to the table of explanations. We would venture to say that no one would offhand imagine that "W. O. A." stood for "Warner and Williams' Orchid Album," or that "B" represented Maund's 'Botanist.'

Das botanische Practicum; von EDUARD STRASBURGER (Jena, Gustav Fischer, 1884.

Das kleine botanishe Practicum für Anfänger; von EDUARD STRASBURGER (Jena, Gustav Fischer, 1884).

IN these two books Prof. Strasburger has supplied a very urgent want. So many researches have been spoilt through ignorance of proper methods in carrying them out, that instruction on the subject must be a welcome contribution to literature. In the former and larger of these two books, the course of practical work is designed for advanced students especially, though the sections in large type were originally intended to serve as elementary lessons, while the details accompanying these in smaller type were for the use of those who proceed farther. Though such an arrangement has many advantages, it is obvious that there is much to be said against it, and the author has at once answered such objections by the production of the latter book for the use of beginners. This elementary book is an exceedingly lucid and serviceable reduction of the larger one, and is certain to prove of great benefit. The 'Botanische Practicum' itself will be of use, not only in fitting the advanced student for original research, but as a handbook for elementary teachers, who in practical demonstrations are sometimes in the dangerous position of knowing very little more than what they teach. The book is divided into thirty-four lessons, prefaced by an introduction dealing with microscopes and all necessary apparatus, and containing advice of the most excellent kind. The lessons are adapted to the progress of the student, beginning with simple subjects and proceeding to more complex. Each lesson, it may be said, is sufficient to occupy even students of a very advanced type, for considerably longer than the term lesson commonly implies. In the present position of microscopical research, a book of this kind has become necessary to the large class of "workers by themselves," to enable them to keep pace with the progress of science. It is necessary now to bring so much more than mere microscopic vision to the work, that instruction in the various methods of preparation of objects (such as bacteria, &c.) will give this book an especial value in the eyes of those whose isolated position deprives them of the resources to which others have access. G. M.

Vergleichende Morphologie und Biologie der Pilze, Mycetozoen und Bacterien; von A. de Bary. (Leipzig, Engelmann, 1884).

Those who take up this book with the expectation af finding in it a second edition of the author's 'Morphologie und Physiologie der Pilze, Flechten und Myxomyceten' will be agreeably surprised to find that the progress of mycology during the last twenty years has been such as to necessitate the production of what is in point of fact a new book; and, moreover, that Prof. de Bary has again undertaken the arduous labour of gathering in the materials thus furnished, and of providing from these a text-book worthy of the progress it chronicles. To give any adequate idea of the contents and the manner of treatment of the great range of subjects would need wider bounds than those of a short notice. Such a notice, however, would be incomplete without mention of the classification of Fungi adopted by Prof. de Bary, which though first sketched two years ago in the Beiträge zur Morph. v. Physiol. der Pilze, now gains special importance from its employment in what will prove no doubt the standard text-book for a number of years to come.

Prof. de Bary thus classifies the Fungi, and no one can read the chapter dealing with the principles underlying the classification without feeling the force of the case made out for it:—

I. The Ascomycetes Series.

1. Peronosporeæ (with Ancylisteæ and Monoblepharis).
2. Saprolegnieæ.
3. Mucorini or Zygomycetes.
4. Entomophthoreæ.
5. Ascomycetes.
6. Uredineæ.

II. Groups diverging from the Ascomycetes Series or of doubtful position.

7. Chytridieæ.
8. Protomyces and Ustilagineæ.
9. Doubtful Ascomycetes (Saccharomyces, &c.).
10. Basidiomycetes.

Groups 1—4 are, from their approach to Algæ, classed together as Phycomycetes.

Of those in Category II., 7 and 8 are to be regarded as standing in relation to the Phycomycetes; 9 in relationship, of course, with 5; and 10 with 6.

They can therefore be taken in linear series thus:—

1. Peronosporeæ—
    - *a*. Ancylisteæ.
    - *b*. Monoblepharis.
2. Saprolegnieæ.
3. Mucorini.
4. Entomophthoreæ.
5. Chytridieæ.
6. Protomyces and Ustilagineæ.
7. Ascomycetes.
8. Doubtful Ascomycetes.
9. Uredineæ.
10. Basidiomycetes.

After dealing with the Fungi proper, the life-histories of the orders, their physiology, &c., Prof. de Bary proceeds to the Mycetozoa and subsequently to the Bacteria, each of these great groups being considered in great detail and with striking lucidity. One cannot say more of the book than that no serious worker at these interesting organisms can either dispense with it or consult it without profit.

G. M.

A Monograph of the Algæ of the Firth of Forth. Illustrated with herbarium specimens of some of the rarer species. By G. W. Traill, Joppa, near Edinburgh. 1885. 4to.

At first sight this work would appear to be merely a list of the Algæ of the Firth of Forth, illustrated with a few specimens. It is, however, the result of the work of a true and enthusiastic naturalist, who, in spite of numerous difficulties, has for many years carefully observed and recorded the appearance, maturity and disappearance, year after year, of all the species here recorded. It is therefore extremely valuable, as indicating just those points concerning Marine Algæ to which too little attention has been paid by many authors. The consequence of this neglect has hitherto been that in this country, at least, very few investigations of the fructification of this class of plants have been made, and in several common British species some forms of fruit are still unknown. Mr. Traill, by constant searching during the most inclement weather, has discovered the unilocular sporangia of *Sphacelaria plumigera*, and has thus helped to prove that it belongs to the genus *Sphacelaria* and not to *Chætopteris*, with which it had previously been confounded, the same discovery also showing that *Chætopteris* should rightly be placed under *Cladostephus*. He has also searched for and found several Scandinavian species which had been pointed out to him as likely to occur on the east coast of

Scotland. He has, moreover, rendered good service in recording the host plants upon which other Algæ grow parasitically. The number of species enumerated, as found on the shores of the Firth of Forth, are 225, of which one-ninth of the whole number are new to Britain, having been found since the publication of Harvey's 'Phycologia Britannica.' The observations which Mr. Traill has made and now published must therefore be regarded as a valuable contribution to our knowledge of the British Marine Flora, and to the life-history of nearly half the British species. There are eight illustrations of the rarer species, varying in different copies, but *Sphacelaria plumigera*, *Callithamnion arbuscula*, and *Dictyosiphon Mesogloia* occur in most of them, and *Callithamnion barbatum* in some. The work should be in the hands of all lovers of this beautiful class of plants, and especially of those interested in the fructification of Marine Algæ.

E. M. H.

Messrs. W. H. Allen & Co. send us a pretty little volume of Transatlantic origin, entitled 'The Wonders of Plant-life under the Microscope,' by Sophie Bledsoe Herrick. The chapters are in part reprinted from 'Scribner's Monthly,' with several additional ones intended to render the series more connected. Insectivorous plants come in for a large share of consideration. There are numerous illustrations, many of them good and new.

New Books. — O. Kirchner, 'Die Mikroscopische Pflanzenwelt des Süsswassers' (Braunschweig, Hæring, 1885 (1884); 4to, pp. x. 56. 4 plates). — M. Gandoger, 'Rubus nouveaux' (Paris, Savy: 8vo, pp. iv. 145).—A. Cariot, 'Etudes des Fleurs: Botanique Elémentaire, descriptive, et usuelle, renfermant la Flore du Bassin Moyen du Rhone et de la Loire' (Lyon, Vitte et Perrussel: 3 vols. 8vo, pp. xvi. 440, tt. 23; pp. viii. 892; pp. xvii. 342).—A. Franchet, 'Plantæ Davidianæ ex Sinarum imperio: pt. i. Plantes de Mongolie' (Paris, Masson: 4to, pp. 390, tt. 27).—G. Vasey, 'The Agricultural Grasses of the United States' (Washington, Government Printing Office: 8vo, pp. 144, tt. 120).

Articles in Journals.

American Naturalist. — J. B. Ellis & G. Martin, 'New N. American Fungi' (*Septoria purpurascens*, *Pestalozzia scirpina*, *Cercospora racemosa*, *Ovularia monilioides*, *Sphærella platani*, spp. nn.).

Ann. & Mag. Nat. Hist. — W. Houghton, 'Notices of Fungi in Greek and Latin Authors.'

Botanical Gazette (Dec.).—G. Vasey & E. L. Scribner, *Eriochloa Lemmoni*, sp. n. (1 plate). — F. L. Scribner, 'Arizona Plants' (*Muehlenbergia depauperata*, sp. n.).—T. J. Burrill, 'New *Uredineæ.*' —A. Gattinger, *Silphium brachiatum*, n. sp.

Bot. Centralblatt (No. 1). — H. Bruchmann, 'Das Prothallium von *Lycopodium*' (1 tab.).—(No. 2). V. v. Borbás, '*Arabis apennina* Tausch.' — (Nos. 3 & 4). E. Ihne, 'Karte der Aufblüh zeit von *Syringa vulgaris* in Europa.'

Bot. Zeitung (Dec. 19, 26).—H. Will, 'Zur Anatomie von *Macrocystis luxurians*' (1 plate).—F. Schmitz, 'Erwiderung.'—(Jan. 2, 9). H. de Vries, 'Ueber die Bedeutung der Circulation and der Rotation des Protoplasma für den Stofftransport in der Pflanze.'—(Jan. 2). L. Klein, 'Ueber die Ursachen der ausschliesslich nächlichen Sporenbildung von *Botrytis cinerea.*'—Jan. 16, 23). C. Fisch, 'Ueber die Pilzgattung *Ascomyces*' (1 plate).

Bull. Soc. Bot. France (tom. xxx.: Session à Antibes, pt. 2).—E. Malinvaud, 'Les *Melica* du groupe *ciliata.*'—C. Flahault, '*Lithoderma fontanum*' (1 plate).—E. Burnat, 'Botanistes qui ont contribué a faire connaître la flore des Alpes-Maritimes.'—(tom. xxxi. Comptes rendus, No. 6).—G. Rouy, 'Excursions botaniques en Espagne.'—P. van Tieghem, 'Dèveloppement de l'amylobacter dans les plantes à l'état de vie normale.'—L. du Sablon, 'Mécanisme de la déhiscence des sporanges des cryptogames vasculaires.'—J. de Seynes, 'Les Conidies mycéliennes du *Polyporus sulphureus.*'—P. van Tieghem, 'Sur une anomalie des branches du *Pinus Pinaster.*'—Id., '*Coenonia*, genre nouveau de myxomycètes a plasmode agrégé.'—G. Bonnier & L. Mangin, 'Sur les variations de la respiration des graines germant avec le développement.'—P. Sagot, 'Sur la vie et les travaux de J. Lépiné' (1817–1884).—C. Flahault, 'Sur les collections botanique de la Faculté des Sciences de Montpellier.'—L. Guignard, 'Sur la structure et la division du noyau cellulaire.'—F. Gay, 'Sur les conjuguées du Midi de la France' (many new spp.).—(No. 7). A. Franchet, 'Sur quelques plantes de France' (*Isoetes*, *Andropogon provincialis*).—P. van Tieghem, 'Culture et développements du *Pyronema confluens.*'—Battandier, 'Plantes de la Flore d'Alger.'—A. Franchet, 'Quelques espèces de *Gentiana* du Yunnan' (*G. rubicunda*, *fastigiata*, *alsinoides*, *papillosa*, *lineolata*, *primulæfolia*, *Serra*, *yunnanensis*, *Delavayi*, *tenuifolia*, spp. nn.).—P. van Teighem, 'Structure et affinités des Pittosporées.'—Id., 'Structure et affinités des *Mastixia.*'—P. Duchartre, 'Fleur double d'un *Bouvardia.*'—A. Franchet, *Isoetes Savatieri*, sp. n.—E. Prillieux, 'Sur le *Peronospora Setariæ.*'

Bulletin of Torrey Bot. Club (Nov. & Dec.).—J. B. Ellis & W. A. Kellermann, 'New Kansas Fungi' (new species of *Cercospora*, *Ramularia*, and *Sphærella*).—A. F. Foerste, 'Nectar-glands of *Apios tuberosa.*'—G. Vasey, 'New Grasses' (*Stipa Scribneri*, *Festuca confinis*, *Elymus Saundersii*, spp. nn.).

Garden (Jan. 3).—*Sagittaria montevidensis* (ic. pict. & fig.).—Portrait of John Lee.—(Jan. 17). *Odontoglossum cordatum* (ic. pict.).

Gardeners' Chronicle (Jan. 10).—*Abies religiosa* (fig. 13).—(Jan. 24). *Pinus patula* (fig. 20). *Odontoglossum viminale* Rchb. f., n. sp. A. D. Webster, *Neottia Nidus-avis.*—Fasciated Medlars (fig. 21).—(Jan. 31). W. A. Herdman, '*Coryanthes*' (figs. 27–29).

Grevillea.—H. T. Wharton, 'On Fries' Nomenclature of Colours.'—M. C. Cooke, 'Demerara Fungi.'—Id., 'New British Fungi.'—W. Phillips & C. B. Plowright, 'New and rare British Fungi'

(*Agaricus hypoxanthus*, *Russula Duportii* Phil., *Cyphella brunnea* Phil., *Myxotrichum cancellatum* Phil., *Puccinia perplexans* Plowr., spp. nn.).

Journal of Linnean Society (xxi., No. 135, Dec.).—J. M. Crombie, 'On the Algo-Lichen Hypothesis' (tt. 2). — R. A. Rolfe, 'On the Flora of the Philippine Islands and its probable derivation' (many new species: *Villaria*, gen. nov.: t. 1 tab.).—J. G. Baker, 'Further Contributions to the Flora of Central Madagascar' (many new species: *Sphærospalum*, *Rhodoclada*, *Neobaronia*, *Phornothamnus*, *Phellolophium*, *Melanophylla*, n. gen.).

Magyar Novénytani Lapok (June). — 'Collectiones Plantarum e quibus Herbarium Dris Ludovici Haynald Cardinalis et Archiepiscopi Colocensis coaluit.' — (Dec.). J. Schaarschmidt, '*Galanthus nivalis*, *Echinopsis oxygena* és az Euphorbiaceák spaerokrystalljairól.'

Midland Naturalist. — J. E. Bagnall, 'Flora of Warwickshire' (*Cyperaceæ*).

Nuov. Giornale Bot. Ital.—A. Goiran, 'Prodromus Floræ Veronensis.' — F. Tassi, 'Degli effetti anestesici nei fiori.' — G. Cugini, 'Descrizione anatomica dell' infiorescenza e del fiore femmineo del *Dioon edule*' (1 plate).

Œsterr. Bot. Zeitschrift.—Von Hohenbühel, Memoir of Wilhelm Voss (portrait).—F. Leithe, 'Kryptogamenflora von Tirol.'—V. v. Borbás, 'Teratologisches.' — E. Preissmann, 'Zur Flora von Kärnten.'—P. G. Strobl, 'Flora des Etna' (cont.).

Pharmaceutical Journal (Jan. 24). — C. E. Stuart, 'How Plants grow.'—R. Amory, 'Oil of Cade' (*Juniperus Oxycedrus*).

Scottish Naturalist.—C. C. Babington, 'Naturalisation of Plants.' —G. C. Druce, 'Botanical Work of G. Don.' — J. Stevenson, 'Mycologica Scotica (supplement).'

Trans. Linn. Soc. London (2nd ser. ii. 8, Dec.). — T. H. Corry, 'Structure and development of gynostegium and on mode of fertilization in *Asclepias Cornuti* Dcne' (3 plates).

BOTANICAL NEWS.

We are glad to learn that the Woolhope Naturalists' Field Club has commenced the publication of the flora of the county of Hereford, and it is hoped that the volume will be in the hands of the members by the end of the summer. A summary of the plants found in the county was published in the Transactions of the Club so far back as 1867, but the completion of the flora, for various reasons, was unavoidably postponed. The work will be edited by the Rev. Augustin Ley. It will be brought up to the present time, and thus some amends be made to botanists by the greater completeness attained.

HOMOLOGY OF THE FLORAL ENVELOPES IN *GRAMINEÆ* AND *CYPERACEÆ*.

By F. Townsend, M.A., F.L.S.

It is now more than ten years since I called attention, in the pages of this journal,* to "some points relating to the morphology of *Carex* and other Monocotyledons." In my paper on this subject I then stated that I hoped, on a future occasion, to shew "that there is a great similarity in the construction of grasses and sedges, and that the correlative position of their parts leads to the conclusion that the two-nerved or keeled inner pale of grasses is a single floral bract. I propose now, in a measure, to fulfil that promise, in the first place by recording my notes on several species belonging to the orders *Gramineæ* and *Cyperaceæ*, and secondly, by stating the conclusions which may be drawn from the facts brought forward, and my present paper may be considered as supplementary to my former one. I say in a measure, because I am aware that the subject might be better and more fully handled, but as time and opportunity might fail me, it seems better that my promise should be even imperfectly rather than not at all fulfilled.

Notes on several species belonging to the order Cyperaceæ, examined more particularly with the view of ascertaining the homology of the parts of the inflorescence.

Carices: *Heterostachyæ.*

(In all the following species the ochrea is short.)

Carex riparia.—The ochrea in this species is short, cloven to the base and dark-coloured (Tab. A., fig. 2). The ochrea of the upper female spikes is swollen at the sides (Tab. A, figs. 2, and 7 *a*), and approaches nearer to the form of the utriculus, shewing the passage of the ochrea into the utriculus.

At the base of every male spike will be found, universally present, a fertile flower with single open glume or utriculus situate next the main axis, alternate with and opposite to the primary bract from which the male spike springs.

There is an analogy between the bracts subtending the female and barren flowers and the utriculus, both being of the nature of a bract. This analogy may be well traced in the bracts of this species, see Tab. A, figs. 3, 4, 5, 6.

I have met with several instances in which the bract subtending the utriculus has become bifid and three-nerved, also trifid and three-nerved (see Fig. 7, *b* and *c*.). These bracts had one utriculus within their axil. It is easy to conceive this trifid bract as pointing to the true nature of the three stamens, *viz.*, a single trifid organ, each division bearing one anther.

It was in the examination of this species that I first discovered the true nature of the ochrea and utriculus, and saw that the somewhat common abnormal growth of *C. glauca* (in which the female spikes become compound) exhibits the normal or universal law of the growth of the inflorescence of the whole genus (See paper already cited; Journ. Bot., June, 1873).

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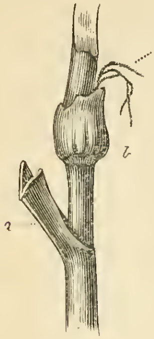
* Journ. Bot. 1873, p. 162.

Tab. A.—Form of ochrea and bracts in *Carex riparia.*



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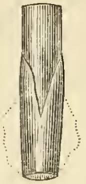

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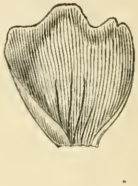

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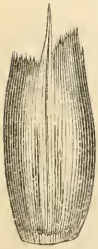
Fig. 1.—*a*, leafy bract (partially removed) below a male spike; *b*, bract-like utriculus at the base of of male spike; *c*, stigmas of nut within *b*.

Fig. 2.—Axillary bract or ochrea at the base of secondary axis of female spikes of *C. riparia*; the dotted or wavy line indicates the outline of the form which the bract takes at the base of the upper spikes, where it has already a tendency to inflate and assume the shape of the utriculus, and to form veins.

Fig. 3.—The transformation of the bracts into the utriculus is well seen in the male spikes of *Carex riparia.* This fig. shews one of these bracts. The lower portion of the bract is coloured and veined almost as in the perfectly-formed utriculus of the fertile spikes, and the sides lengthen for the teeth.



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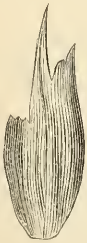

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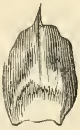

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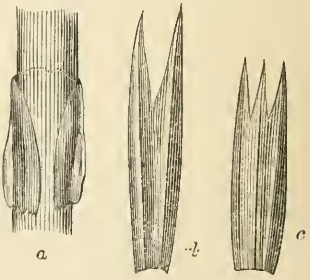

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Figs. 4 & 5.—Scales of male catkin of *Carex riparia.*

Fig. 6.—Utricular bract (axillary bract) at the base of a male catkin of *C. riparia;* this bract was not clasping.

Fig. 7.—*a*, this scale-like ochrea is situate at the base of a fertile spike; it shows the commencement of the transformation of the ochrea (axillary bract) into the utriculus; it is scale-like, with the exception of a fleshy green mass with side nerves distinctly visible. The central nerve of the scale has disappeared. *b* and *c*, forms not unfrequently assumed by the outer bracts subtending the utriculus in the female spikes.

C. præcox.—The ochrea is here a short, tubular, closely-fitting sheath, truncate, cloven on the anterior side (Tab. B, fig. 11). In this species I have met with an instance of a fertile spike becoming barren at the top, bearing a scale in the axis of which was a nut only, in the place of the three stamens, the utriculus being altogether suppressed; the stigmas were perfect and three in number. I have observed two similar instances in this species. The scales bearing the nut were in both cases situate adjacent to the usual barren scales of the male flowers.

Tab. B.—The figs. here show the ochreæ and the development of the secondary axis in the lower flowers of the female spike, in the inflorescence of *Carex præcox*.

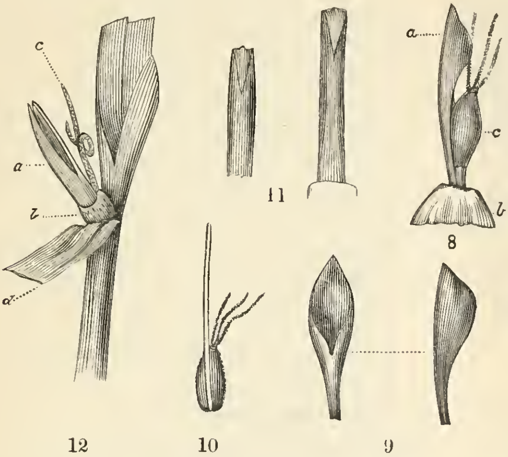

Fig. 8.—*a*, folded leaf, tubular below, produced on the secondary axis of a fertile flower, near the base of the female spike, the utriculus being removed; *b*, the bract turned back and partially removed; *c*, the nut.

Fig. 9.—The folded leaf of fig, 8 *a*, removed; front and profile view.

Fig. 10.—Setiform growth of the secondary axis in another flower near the base of the female spike. In this instance the setiform growth was not accompanied by any leaf development.

Fig. 11.—Ochreæ on the peduncles of the female spikes.

Fig. 12.—This fig. represents the base of the male spike of *C. præcox;* the first bract, *d*, being turned back, shows a utriculus, *b*, the secondary axis of which is developed and bears bracts *a*. The stigmas, *c*, protrude from the utriculus. If in this specimen the secondary axis had developed more fully it would have become an upper spike of female flowers, whereas, in this instance, there was but one female spike.

A second specimen of this species confirmed the above view, as the lowermost bract in the position of *d*, fig. 12, bore a very small spike of female flowers, which might have escaped attention without close examination. The spike issued, as above, from a utriculus, the stigmas of which protruded from its mouth, pushed rather on one side by the growth of the secondary branch.

It may be noted here that the upper bracts of the male spike are "surrounding," the last but one surrounding the last and terminal bract most completely. The position of the three filaments of the stamens within the bracts is collateral in all but the terminal flower; in the terminal flower, where the filaments are free from lateral pressure, they are placed in a triangular position.

C. panicea.—The ochrea of the lowest female spike is short, 2–8ths in. in length, and many times shorter than the peduncle. It is sheathing, with a rounded, oblique, or truncate apex, convex in front, flattened on the back, keeled on either side.

C. pendula.—The ochrea here is short, 3–16ths in. to 2–8ths in. long, sheathing, but slit on one side nearly to the base, membranous, nerved, with truncate, erose, fuscous apex, those of the upper peduncles with two distinct green nerves on either side.

C. binervis.—Here the ochrea is short (but long as compared with that of *C. lævigata*) 2–8ths in. in length, tubular, membranous, with slightly oblique truncate mouth.

C. lævigata.—Here the ochrea is remarkably short, sheathing, membranous, truncate, and affords a good specific character by which this species may be at once distinguished from *C. binervis*. The lowest bract of the barren spike in this species usually bears *four* stamens in its axil, and these are always placed collaterally. In two or three instances I have found this bract bearing *five* stamens.

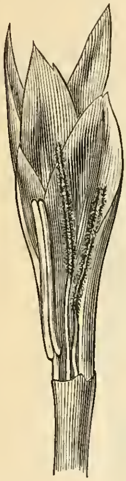

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Fig. 13.—This represents the base of a male spike of *C. lævigata*, the lowest bract of which bore in its axil one stamen and two styles with stigmas, the two styles being approximate.

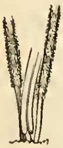

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Fig. 14.—This represents an instance (recorded in 1872, and drawings made at time of observation) in which one of the bracts, at the base of a male spike of *C. lævigata*, bore one central stamen, and two styles, one on either side of the single stamen.[*] There was no appearance of any ovary, and the styles ended as abruptly below as the filaments of the stamens.

In this species I have, in one instance, found the lowest bract of a male spike, bearing, instead of stamens, a female flower with single nut and two stigmas and a bract-like, imperfect utriculus, with a lateral position.

C. glauca.[†]

C. paludosa, *C. Pseudo-cyperus*, *C. limosa*, *C. montana*, *C. pilulifera*.—In all these species the ochrea is short.

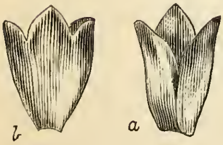

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Fig. 15.—Axillary bract or ochrea at the base of the uppermost female spike of *C. pilulifera*. *a*, front view; *b*, back view.

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[*] For an analogous case on record, see Journ. Linn. Soc. vii., p. 121, and xx., p. 45.

[†] For notices of remarkable growth of the seta in this species see Journ. Bot. 1863, p. 163, and Journ. Linn. Soc., xx., p. 45.

C. rigida.—Here the ochrea is very short and bract-like, dark coloured, with oblique mouth.

CARICES: *Heterostachyæ.*

(In all the following species the ochrea is long.)

Carex hirta.—The ochrea on the peduncles of the lowest female spike is nearly half the length of the peduncle; it is closely fitting, tubular, membranous, nerveless, erose-truncate, ciliate at its apex, cloven a little way down on its anterior side; the ochrea of the peduncle of the uppermost female spike is as long as or even longer than the peduncle, and is more deeply cloven. The peduncles of the lateral barren spikes bear an ochrea in the form of an open nerved utriculus without any nut.

C. sylvatica.—The ochrea of the lower female spikes is a long, closed and closely-fitting, transparent, membranous sheath, slightly divided at the apex; the ochrea of the upper spikes becomes swollen on one or both sides, and assumes more or less the form of the utriculus. I have met with several instances, in this species, in which the ochrea is situate at some distance above the spring of the secondary axis; in these cases the ochrea takes the form, more or less, of the utriculus, being only partially closed, and the nut being sometimes present, sometimes absent.

C. extensa.—The ochrea, from a long-stalked fertile spike from near the base of the stem, is long, tubular, sheathing, open only a short way down in front; it is nerveless, membranous, fuscous. At the base of all the fertile sessile spikes it is shorter, faintly nerved, and open in front.

C. flava.—Here the ochrea is long, tubular, and sheathing, and similar in all respects to that of *C. extensa.*

C. pedata.—Here the ochrea is long (about one-third the whole length of the peduncle), rather loosely sheathing, tubular, membranous, its mouth oblique, its apex triangular, acute.

C. depauperata.—Here the ochrea is very long, delicately membranous, and sheathing.

C. digitata.—Here the ochrea is long, delicately membranous, and sheathing.

C. œdipostyla.—Here the ochrea is long, delicately membranous, and sheathing.

CARICES: *Homostachyæ.*

C. remota.—Here the ochrea is ovate-orbicular, membranous, concave at the back, and keeled on either side, the keels being formed of the strong lateral nerves; the apex is erose; the form is therefore bract-like, and it encloses or surrounds the base of the spikes and lower flowers.

C. arenaria.—The ochreæ of the lower fertile spikes are reduced to fuscous, many-veined bracts, angular at the base and sometimes bifid at the apex, shewing a tendency to take the form of the utriculus. There is no central green nerve, like that of the bracts of the fertile flowers.

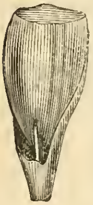
C. ovalis.—The first bract on the secondary axis is placed somewhat laterally, and bears stamens, and is similar to the bracts of the other barren flowers, with the exception that it is more amplexicaul. It seems possible that this bract may represent the ochrea.

C. stellulata.—Here there seems to be an absence of an ochrea, or of any bract that can be recognised as taking its place. The first and lowest bract on the secondary axis is usually placed laterally and contains stamens.

CARICES: *Monostachyæ.*

C. elongata.—The ochrea in this species appears to be absent, or its place is occupied by the bract of a normal male flower.

C. pulicaris.—There appears here to be no bract which can be recognised as taking the place of the ochrea. There are several sheathing-bracts, with minute leafy appendage, on the stem, the innermost being alternate with the first bract of the spike. Possibly the ochrea is represented by this innermost sheathing leaf or bract.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In this species I have met with a barren flower bearing two stamens with their filaments united, the anthers being free, while the filament of the third stamen was altogether free.

The accompanying fig. shews the seta-like development of the secondary axis within the utriculus.

Fig. 16.—*Carex pulicaris:* secondary axis at the base of the nut being acicular in form or bristle-like.

SCIRPUS.

Scirpus sylvaticus.—In this plant every branch of the inflorescence is furnished with an ochrea, even up to the last simple spike.

CLADIUM.

Cladium Mariscus.—Here the ochrea is present at the base of all the branches of the inflorescence, but concealed by the sheathing outer bracts. The homology of the barren glumes of grasses is here easily traced. Every ultimate simple spike of the inflorescence of this species is furnished with two bracts, similarly placed, as are the barren glumes of grasses, the upper bract subtending the lower one and alternate with it.

CYPERUS.

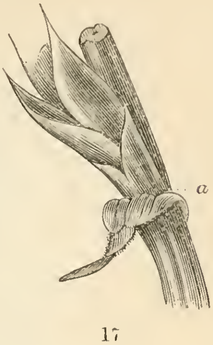
Cyperus longus.—Here the ochrea is present, and the homology of the infloresence of the grasses is as beautifully seen as in *Cladium Mariscus*, the lower and upper barren glumes of grasses being represented by the two lower glumes of each spike of the flowers of *Cyperus.*

KOBRESIA.

Kobresia caricina.—This plant, together with *Elyna spicata*, illustrates the structure of the spikelet in grasses very beautifully.

Fig. 17.—*Kobresia caricina:* the outer bract turned back and exposing the ochrea or spathal bract.

GRAMINEÆ.



I now go on to record, in the Order *Gramineæ*, a few instances of abnormal development which are relevant to our present subject, and shall end my paper by giving the conclusions which I think may fairly be drawn from the facts and reasoning brought forward.

Botanists are generally agreed that the terms "pale," "fertile glume," "upper and lower barren glumes," are more in accordance with the homology of the spikelet of grasses than the terms "inner or upper pale," "outer or lower pale," and "upper and outer" or "lower and inner glumes"; and all deviation from the ordinary form or arrangement of parts, or, in other words, all instances of abnormal development are of special interest if they support these views.

I have, in my notes, the record of the occurrence, in 1873, in Hampshire, of a specimen of *Lolium perenne*, or common rye-grass, in which the upper, outer, single, and usually barren glume of one of the spikelets was transformed into a fertile one by the development of a bifid pale (exactly similar to the pale of a normal fertile floret) alternate with, *i.e.* subtending, the glume. The ovary was, to all appearance, perfect, but there was only one stamen.

Both Babington and Koch call the suppressed glume in *Lolium* the "upper" glume, while Kunth calls it rightly the "inner" or "lower" glume. It is evidently the lower barren glume which is wanting, as may be proved by its position in *Festuca loliacea*, and also by the alternation of the florets, as well as by the homology of the spikelet. Now this lower glume being the inner one, there must be, normally, a suppressed outer and subtending leaf or bract at the base of each spikelet, and the evidence of its normal position and suppression may be distinctly seen, by the presence of a raised border extending transversely more than half way round the axis of the spikelet (it is seen more faintly at the base of the upper spikelets), and this bract sometimes becomes developed more or less.

The presence of a membranous border, in a similar position, in many grasses, is very evident, especially in *Cynosurus cristatus*, and it occasionally becomes considerably developed, as in *Sesleria cærulea*. I have also specimens of *Serrafalcus arvensis* (fig. 18), and *S. commutatus*, in which the bract is developed as a leafy setaceous appendage.

I once gathered a specimen of *Festuca loliacea* in which the upper barren glume of one of the upper spikelets was developed into a perfect flower, as in the case of *Lolium*. In some spikelets of *F. loliacea* the inner or lower barren glume is wanting, or is reduced to a very minute scale placed laterally; and I have recorded an instance in which this inner glume was replaced by two scales inserted symmetrically side by side, the two taken together occupying the position of the usual inner glume, thus shewing a tendency in the floral envelopes to become divided, which tendency may be seen in the axillary bract (ochrea of Duval Jouve) of *Carex.*

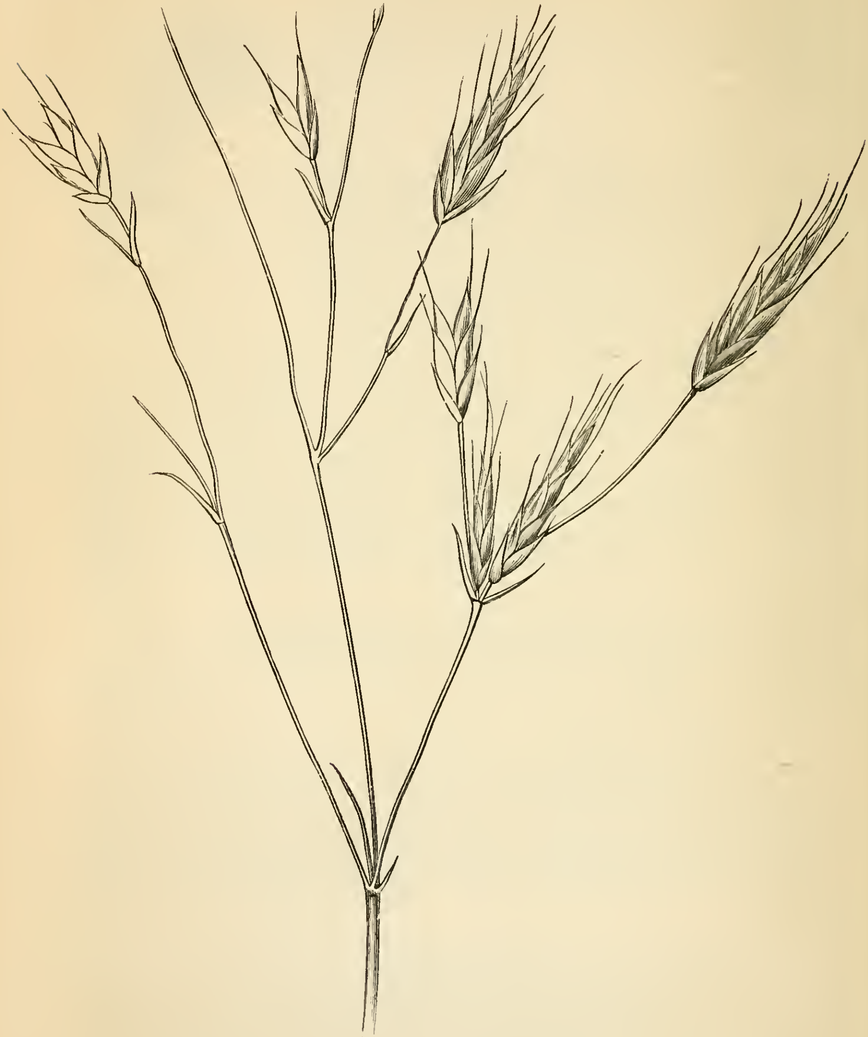


Fig. 18.—Panicle of *Serrafalcus arvensis* with leaf-like setaceous bracts.

The second bract beneath the uppermost flowers of *Luzula campestris* is usually divided almost to the base.

In all cases where I have looked into the matter, it seems to me evident that the lower and inner barren glumes of the spikelets of grasses is next the rachis, *i.e.*, on the inner side of the branch (spikelet), and therefore the position of the absent bract is (as has been already proved by its actual presence in instances just given) alternate with and anterior to the lower and inner barren glume.

Now the utriculus of *Carex* is also always next the rachis, and its subtended bract is alternate and anterior; the position of the utriculus is therefore exactly that of the inner and lower barren glume of grasses, and the position of the subtending bract of the female spike of *Carex* is exactly that of the usually suppressed bract at the base of the spikelets of grasses.

I contend, therefore, that the homologue of the inner and lower barren glume of grasses is the ochrea or utriculus of *Carex*, while the homologue of the suppressed bract at the base of the spikelet in grasses is the subtending bract of the utriculus of *Carex*.

I have said that the tendency of the utriculus or ochrea (the ochrea being undoubtedly the homologue of the utriculus) is to become divided, and this division has been shewn to occur in the lower barren glume of *Festuca;* the tendency also occurs in the pale of grasses generally, which is the homologue (in the upper and fertile florets) of the utriculus of *Carex*, as the fertile glume of the spikelet in grasses is the homologue of the subtending bract of the utriculus in *Carex*.

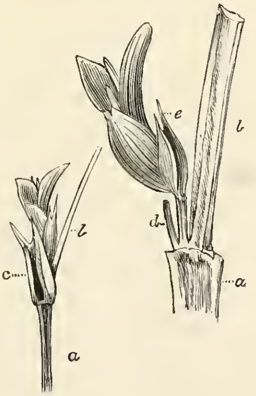


Fig. 19.—These drawings represent a branch from a panicle of *Crypsis aculeata*. The second drawing shows the first one magnified. The bract c, is alternate with the bract (not shown in the drawing) from which the branch *a* springs. The secondary, clasping, two-nerved bract *c*, having been removed in the second drawing, exposes to view the rudiment *d*, which occupies the same place within the axil of *c* as the rudiment within the utriculus of *Carex*. This rudiment is usually present within the axils of all the secondary bracts of the panicle. It is present within the axil of the bract *e*.

N.B.—The small letters, *a* and *b*, refer to the same parts in both figures.

The homology is not weakened by the fact that the lower barren glume is often situate high on the pedicel between it and the usually suppressed subtending bract below, for I have met with numerous cases, particularly in *Carex sylvatica*, in which the axillary bract, or ochrea, is situate some distance from the subtending bract, and in these cases the ochrea takes the form, more or less, of the utriculus, and the ovary is sometimes present, sometimes absent (Tab. A, *Carex riparia*.)

The annexed figure (Fig. 19) of a branch of *Crypsis aculeata* remarkably supports the views set forth in this paper, respecting the similarity of the construction of the parts of the infloresence in grasses and sedges. The pale in this species is one-nerved.

Lastly, the seta which I have found to be more or less developed in so many species of the genus *Carex*, and which is so characteristic of the genus *Uncinia*, has been shown to be the rudimentary development of a secondary axis, while the "acicula" of Dumortier is the terminal portion of the rachilla or main axis of the spikelet; the seta and the acicula are therefore analogous portions of two different axes.

I have endeavoured to prove that the pale in the floret of grasses is the homologue of the ochrea and utriculus in *Carex*, and that the latter is a single floral envelope; therefore, if my reasoning be correct, it necessarily follows that the pale is also single.

FURTHER EXAMINATION OF MR. STEPHEN WILSON'S "SCLEROTIA."

By George Murray, F.L.S.

When the examination of these bodies by Dr. Flight and the present writer was described (Journ. Bot. 1883, p. 370), and it was made known that, so far from being resting states of the potato-fungus, they were no other than masses of oxalate of lime, it might have been expected that the controversy was ended. However, Mr. Wilson's theory, unlike the subject of his speculations, has exhibited, after a period of rest and incubation, a return to the manifestations of life. Mr. Wilson naturally set about testing the results arrived at by Dr. Flight and myself, and succeeded in finding not only the oxalate of lime, but after its removal, by means of nitric acid, another substance which resembled protoplasm. He thereupon jumped to the conclusion that there was life in his "sclerotiets" and in his theory. His paper describing his experiments and inferences appeared in the 'Gardeners' Chronicle' (Dec. 13th, 1884), and with it a statement that Mr. Worthington Smith, working independently, had fully confirmed his observations. A sketch by Mr. Worthington Smith illustrates the gradual washing away by nitric acid of a coat of calcium oxalate from the inner mass, which resisted the action of the acid.*

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* Mr. Smith, it will be remembered, originally determined the bodies in question to be *Protomyces!*

Mr. Greenwood Pim (Gard. Chron., Jan. 17th, 1885) also corroborated Mr. Stephen Wilson's results. Lastly, Prof. Trail, in two Reports to the Scientific Committee of the Royal Horticultural Society (Gard. Chron., Jan. 17th and Feb. 14th, 1885), describes a series of experiments directly confirming Mr. Wilson's. Prof. Trail succeeded in staining the residuum with magenta, iodine, and other colouring matters, and stated that he had "no doubt that the sclerotioids are masses of protoplasm coated with calcium oxalate, probably in the form of minute raphides." He failed to discover any signs of a cell-wall, but supposes that "the outer surface" (of the residuum), "like a primordial utricle, must serve as a wall."

The oxalate of lime, so far accepted, was thus used to render even more astonishing and unique what was sufficiently remarkable before. The organism thus constructed by Prof. Trail would take the place of Mr. Wilson's former mass of "hornified plasm," and, at least in the opinion of the latter, be destined to "plasmodiate," "myceliate," and eventually produce the potato disease.

In repeating these experiments of Messrs. Wilson, Smith, Pim, and Trail with isolated "sclerotiets," there is no difficulty whatever (beyond the ordinary one of manipulation) in discovering the substance left after treatment with nitric acid, and none whatever in obtaining the same results from the various staining processes. The difficulty lies in discovering any evidence of the truth of the statement that the protoplasm *is contained within* a coat of calcium oxalate. The above observers took no pains to prove it to be so, and trusted their case to the baldest assertion. Obviously it suited Mr. Wilson's theory. The possibility of the protoplasm being *outside* the oxalate of lime does not appear to have occurred to them—obviously that would suit my interpretation of the matter, and the theory would fall to the ground again. It is extremely easy to prove that the "residuum" is outside. If, instead of dissolving the calcium oxalate, the colouring matter (iodine solution, for example) be at once applied to an isolated "sclerotiet," the desired stain will be readily obtained. This will appear as a delicate colouring, and not with the intensity that would result were the whole mass to take up the stain. It is therefore apparent that the stained substance is outside the oxalate of lime, and the natural interpretation is that it is but the remains of the original cell-contents of the potato leaf-cell in which the oxalate of lime body was formed, adhering to the latter over the surface.

Mr. Carruthers recently placed in my hands a letter from Dean Buckland to Robert Brown, enclosing leaves, &c., of a potato plant, and asking, "Is the enclosed the same affection of the potato leaves as that of the last two years?" The letter is dated July 19th, 1847, and the Dean, no doubt, referred to the potato disease. There is no sign of disease on the leaves, which, however, contain very abundantly Mr. Wilson's "sclerotiets." Mr. Wilson was thus anticipated in his idea that these bodies are connected with the potato disease. Mr. Carruthers then suggested to me that the potato plants preserved in Sir Hans Sloane's Herbarium should be examined, and four plants were found which had evidently been healthy and vigorous when collected. From each a very minute fragment was taken at random,—all four pieces could easily be placed under an ordinary cover-glass,—and in all cases the so-called "sclerotiets" were discovered. The plants were (1) from the King's Garden, Montpellier, collected by Dr. Charleton (born 1619, died 1707); (2) a plant collected by Boerhaave (born 1668, died 1738); (3) one of Plukenet's plants—Plukenet was born in 1642 and died in 1706; and (4) a plant "collected about 1660," as labelled in Sir Hans Sloane's own handwriting. The two first mentioned contain the bodies in question abundantly, and the remaining two not so plentifully. These experiments and observations appear to me sufficient to prove (1) that the organism constructed by Prof. Trail is a wholly imaginary one; and (2) that the bodies in question have no relation to the potato disease.

NOTES ON THE FLORA OF BUXTON.

By Rev. W. Moyle Rogers, F.L.S.

The following notes are, I believe, strictly supplementary to those which have recently appeared in this Journal on the same subject by the Rev. W. H. Painter (1881) and Mr. J. G. Baker (Jan. 1884). If they contain, as I hope they will be found to do, additional records of some interest, this is due to the fact that my stay at Buxton extended from August 8th to September 8th (1884), and that circumstances compelled me to confine my botanical rambles all that time to the immediate neighbourhood of Buxton, so enabling me to explore a very circumscribed district pretty thoroughly at the best season. Such heights above sea-level as I am able to give I owe to the information on that point supplied in Mr. Baker's paper. The few stations which will be found here, but not in either of the preceding papers,—*viz.*, Chapel-en-le-Frith, Whaley Bridge, and Bugsworth,—lie to the north of Buxton, and are all, I believe, on millstone grit.

Ranunculus Lenormandi F. Schultz. On Axe Edge, in two places very near the top, over 550 yds.; also in the hollow west of Buxton.

Trollius europæus L. Rocks near Lover's Leap; and near the top of the hill opposite the railway-station at Miller's Dale.

Aquilegia vulgaris L. With the last, near the top of the hill above Miller's Dale, over 350 yds., in fair quantity, and undoubtedly native.

Sisymbrium officinale Scop. Monsal Dale, 200 yds., two or three plants; not seen about Buxton. — *S. Alliaria* Scop. Rocks near Lover's Leap, 350 yds.; Miller's Dale.

Cardamine flexuosa With. Chapel-en-le-Frith; up to 350 yds. about Buxton; Ashwood Dale; Miller's Dale. Quite common.

Arabis Thaliana L. In one spot on the rocks near Lover's Leap, 350 yds.

Viola palustris L. Marshy ground near Buxton, both east and west of the town; especially abundant near the Reservoir. —

V. odorata L. Miller's Dale, but only near houses.—*V. lutea* Huds. Corbar Hill, north-east slope, over 350 yds.; in plenty, flowers mostly all yellow.

Polygala oxyptera Reich. Top of Corbar Hill, about 400 yds., very characteristic and plentiful. To this segregate perhaps belongs most of the *Polygala* in the limestone dales near Buxton and on Axe Edge; though some of it, I think, and certainly all that I saw near Chapel-en-le-Frith, must be named *P. depressa* Wender. I saw nothing that I should name typical *vulgaris*.

Silene inflata Sm. Miller's Dale, in one place, over 300 yds., on the hill above the railway-station.

Stellaria Holostea L. Ascends to 350 yds. near Buxton.

Arenaria trinervia L. Chapel-en-le-Frith; up to 350 yds. at Buxton.—*A. leptoclados* Guss. Valley of the Wye, between Miller's Dale and Monsal Dale, in two or three spots, up to 250 yds.

Sagina apetala L. Steps of the "Slopes" at Buxton.—*S. ciliata* Fries. In one place (waste ground) near the Buxton Public Gardens. — *S. nodosa* Meyer. Miller's Dale.

Spergula arvensis L. In one place at Buxton.

Hypericum tetrapterum Fries. Chapel-en-le-Frith; Wye Valley, below Miller's Dale.

Geranium sanguineum L. Limestone ledges in the Wye Valley, a little east of Miller's Dale, with *Silene nutans* and *Centaurea Scabiosa*, up to nearly 300 yds.

Ulex Gallii Planchon. Chapel-en-le-Frith, very abundant; up to nearly 400 yds. on Corbar Hill, Buxton.

Sarothamnus scoparius Koch. Seen only on railway-banks at Chapel-en-le-Frith.

Trifolium medium L. Chapel-en-le-Frith; Lover's Leap.

Vicia angustifolia Roth. Up to nearly 300 yds. in Miller's Dale, but apparently scarce.

Orobus tuberosus L. Between Bugsworth and River Goyt; Chapel-en-le-Frith; Miller's Dale.

Alchemilla arvensis Scop. Chapel-en-le-Frith. Seen nowhere else; while *A. vulgaris* L. is one of the commonest plants in all grassy places.

Potentilla procumbens Sibth. In the lane from Bugsworth towards Whaley Bridge.

Rubus affinis W. & N. I give this name, on Mr. Baker's authority, to a luxuriant and very handsome bramble which I found in great quantity about "New Mills," on the Derbyshire side of River Goyt, near Whaley Bridge Railway-station. He considers it the usual northern form of this species. I had thought it nearer *R. calvatus* Blox., but I have seen nothing quite like it in S. England. — *R. leucostachys* Sm. In one place only, near the top of the hill above Monsal Dale, by the Cressbrook School Church, about 250 yds.; very fine and characteristic.—*R. discolor* W. & N. I searched for in vain. Close to Buxton, the only bramble (except *Idæus*) that occurs in any quantity is *R. pallidus* Weihe, and that nowhere in the open; but in one spot in Corbar Wood I found a small patch of another species growing in such deep shade as to have lost all good distinctive characters; and in Ashwood Dale, up to 300 yds., as in the Wye Valley generally, and at Chapel-en-le-Frith, &c., to the north of Buxton, the prevalence of *R. pallidus* is rivalled by that of the *R. dumetorum* var. *concinnus* mentioned in the 'Notes on the Flora of Matlock' (Journ. Bot. Nov. 1884), which, I believe, is not distinguishable from the *R. corylifolius*, *γ. purpureus* of Bab. Man. and Lond. Cat. The only other brambles that I saw in the district were *R. corylifolius* Sm. (chiefly good *R. sublustris* Lees), *R. cæsius* L. (scarce), *R. Chamæmorus* L. (Axe Edge only), and a handsome nearly prostrate one on the hill above Miller's Dale Railway-station (350 yds.), which (especially in the foliage) reminded me of *R. Lindleianus* Lees, though clearly distinct from it; this Mr. Bagnall is inclined to name *R. Salteri*, putting it with a similar plant which he finds in three of the Warwickshire woods, and which has been accepted by Prof. Babington as the "*R. Salteri* of Bloxam"; and also with another from Plympton St. Mary, Devon, which Mr. Bloxam named *R. Salteri* for Mr. Briggs many years ago.

Rosa spinosissima L. Chapel-en-le-Frith. At Monsal Dale I found some plants with red fruit. — *R. tomentosa* Sm. Chapel-en-le-Frith, in good quantity. — *R. scabriuscula* Sm. Wye Valley, east of Miller's Dale, one or two large bushes. — *R. canina* L., *R. lutetiana*, and *R. dumalis*. Chapel-en-le-Frith. — *R. biserrata* and *R. urbica*. Wye Valley, between Miller's Dale and Monsal Dale. — *R. arvatica*. Near the top of the hill between Bugsworth and River Goyt. — *R. Reuteri*. In great abundance near Chapel-en-le-Frith, and (with *R. subcristata*) at Monsal Dale.—*R. coriifolia*. Hill above Cressbrook Dale. — *R. Watsoni*. Monsal Dale. — *R. marginata*. Plentiful in Miller's Dale, especially (with *R. mollissima* Willd.) on the hill opposite the railway-station.—*R. arvensis* Huds. Bugsworth; Miller's Dale. Buxton itself seems too high or too exposed for any self-grown rose, though *R. coriifolia* and *R. subcristata* grow luxuriantly at as great a height (350 yds,) on the hill above Miller's Dale.

Epilobium palustre L. Chapel-en-le-Frith.

Circæa lutetiana L. Over 350 yds. in Corbar Wood.

Callitriche verna L. In small artificial pond (deep water) near Chapel-en-le-Frith.

Saxifraga sponhemica Gmel. Near Lover's Leap, and on hill above Miller's Dale; abundant.

Chrysosplenium oppositifolium L. Lover's Leap; Wye Valley, below Miller's Dale.

Hydrocotyle vulgaris L. Up to 350 yds. just above Buxton.

Sanicula europæa L. Chapel-en-le-Frith; over 350 yds. in Corbar Wood.

Ægopodium Podagraria L. Weed in Buxton Public Gardens.

Bunium flexuosum With. Over 350 yds. in Corbar Wood.

Lonicera Periclymenum L. Roadside hedges at top of hill between Bugsworth and River Goyt.

Carduus palustris L. Up to 450 yds. by Axe Edge.

Serratula tinctoria L. Up to 250 yds. in Miller's Dale.

Matricaria inodora L. Chapel-en-le-Frith.

Anthemis Cotula L. Up to 250 yds. in a waste spot in Miller's Dale.

Artemisia Absinthium L. At nearly 350 yds. by the roadside opposite a farm-house above the Miller's Dale Railway-station; denizen. — *A. vulgaris* L. Buxton, very luxuriant at 350 yds., but only in gardens.

Inula dysenterica L. Only near Bugsworth.

Leontodon hirtus L. Hill-side, Miller's Dale. New record for the county.

Tragopogon pratensis L. At about 400 yds., near the top of Diamond Hill.

Crepis paludosa Mœnch. Over 350 yds. in Grin Wood, above Buxton.

Jasione montana L. Up to about 350 yds. in hollow to the west of Buxton.

Campanula glomerata L. Over 350 yds. in woods on both sides of Buxton and at Lover's Leap, but sparingly. — *C. Trachelium* L. Monsal Dale, 200 yds.

Vaccinium Oxycoccos L. Corbar Hill, north-east slope; up to fully 550 yds. on Axe Edge. — *V. Vitis-idæa* L. With the last on Corbar Hill, as well as on Axe Edge; also on Diamond Hill.

Andromeda polifolia L. Up to over 500 yds. on Axe Edge, in some quantity, but apparently local.

Erica cinerea L. Up to about 350 yds. near Buxton.

Gentiana campestris L. On the top of Corbar Hill, with the commoner *G. Amarella.*

Linaria vulgaris L. Up to 350 yds. at Buxton.

Veronica hederifolia L. At about 250 yds. as a garden weed at Cressbrook, but seen nowhere else. — *V. Buxbaumii* Ten. Only near the railway-station at Chapel-en-le-Frith. — *V. officinalis* L. Up to about 400 yds. above Buxton.

Mentha gentilis L. By the Wye in Miller's Dale (250 yds.), two or three plants together. New record for the county.

Stachys Betonica Benth. Up to 350 yds. on the hill above Miller's Dale Railway-station; also near Buxton, but local.

Galeopsis Tetrahit L. At 250 yds. in one place in Miller's Dale.

Myosotis palustris With., β. *strigulosa.* Abundant at 250 yds. in the Wye Valley, at Miller's Dale, &c. — *M. arvensis* Hoffm., β. *umbrosa.* Wye Valley, a little below Miller's Dale.

Amsinckia lycopsioides Lehm. Waste ground in Miller's Dale, several plants, in flower. Alien (Californian).

Symphytum officinale L. In the ground by St. James's Church, Buxton, at 350 yds. Denizen.

Primula officinalis L. Up to about 300 yds. in Miller's Dale.

Lysimachia nemorum L. Chapel-en-le-Frith.

Anagallis arvensis L. At over 350 yds. in one place by roadside on the hill above Miller's Dale Railway-station.

Plantago media L. A luxuriant variety with white filaments (turning pinkish when pressed), and leaves comparatively narrow, unusually green, and ascending—so approaching *P. lanceolata* in aspect. Meadow above Buxton, in considerable quantity, with other fairly typical plants.

Chenopodium album L. Up to 350 yds. at Buxton.

Polygonum lapathifolium L. Up to nearly 400 yds. by Corbar Wood. — *P. Bistorta* L. Meadows near Bugsworth, apparently native.

Euphorbia Helioscopia L. and *E. exigua* L. Together at 350 yds. in a corn-field above Miller's Dale.

Cannabis sativa L. One plant (alien) by quarry at Corbar Wood.

Populus tremula L. At 250 yds. by the Wye in Miller's Dale.

Habenaria viridis Brown. Up to about 400 yds. on Diamond Hill, in plenty.

Listera ovata Brown. From 300 to 400 yds. in Ashwood Dale and on Diamond Hill.

Luzula pilosa Willd. In Corbar Wood, and up to 550 yds. on Axe Edge. — *L. campestris* DC. Near Buxton.

Scirpus setaceus L. Chapel-en-le-Frith; hollow west of Buxton, 350 yds.

Carex ovalis Good. Over 550 yds. near the top of Axe Edge.— *C. præcox* Jacq. Up to 350 yds. near Buxton. — *C. hirta* L. Up to 250 yds. in Miller's Dale.

Agrostis vulgaris With., *β. pumila.* Over 550 yds. on Axe Edge.

Triodia decumbens Beauv. Very common up to nearly 550 yds. on Axe Edge.

Poa nemoralis L. Remarkably common on the limestone.

Lolium italicum Braun. Frequent roadside casual. — *L. temulentum* L. Corn-field casual at about 350 yds. above Miller's Dale.

Asplenium Trichomanes L. Up to 300 yds. on hill-sides in the Wye Valley at Miller's Dale, &c.

Nephrodium spinulosum Desv. (small form). In a slight hollow on the side of Axe Edge, at about 400 yds.

Equisetum sylvaticum L. Near Chapel-en-le-Frith, in plenty; near New Mills, a little above River Goyt.

A NEW HONGKONG *CYPERACEA.*

By H. F. Hance, Ph.D., &c,

Cladium (Baumea) **ensigerum.** — Rhizomate horizontali 2–3 lin. crasso squamis arte equitantibus lanceolatis acuminatis scariosis griseo-fuscis 6–8 lin. longis tecto fibras crassiusculas edente, foliis omnibus radicalibus basi equitantibus rigidis complicatis inferioribus sensim deminutis infimis ad squamas reductis pallide viridibus lineari-ensiformibus acuminatis multinerviis ecostatis inferne purpureo-marginatis margine minute scabridenticulatis 1½-20 poll. longis 3–11 lin. latis, culmis complanatis foliis circ. æquilongis, vaginis inferioribus longis superioribus abbreviatis, paniculæ angustæ ramis primariis plerumque ternis laxiusculis, spiculis 2–3 floris purpurascentibus 5–6 lin. longis, glumis ovato-lanceolatis in acumen exquisite attenuatis, nuce subdrupacea ellipsoidea trisulcata styli basi crassa albo-squamulata coronata.

In ins. Hongkong, juxta pagum Pok fu lum, flf. Jan. frf. Maio 1883, detexit cl. C. Ford. (Herb. propr. n. 22181.)

This species, the discovery of which is due to Mr. Ford's untiring vigilance, is interesting, as affording additional evidence to that given by *Gahnia tristis* Nees, and *Lepidosperma Chinense* Nees, of the affinity of the South Chinese Cyperaceous flora with that of the Australian continent. Its nearest allies are, I believe, *C. Preissii* F. Muell. and *C. laxum* Benth., both from Western Australia, of neither of which do I possess specimens. The creeping rhizome, flat, non-spongiose leaves, and narrow panicle readily distinguish it from the Singalese *Baumea crassa* Thw.!

NOTES ON THE BRITISH *CHARACEÆ* FOR 1884.

By Henry & James Groves.

Since the publication of the last instalment of our 'Notes' we have had but little to record beyond additions to the account of the comital distribution of the species and varieties. *Lychnothamnus stelliger*, from South Devon, *Chara contraria* var. *hispidula*, from Cheshire, *Tolypella prolifera*, from Cambs. and Hunts, and *T. glomerata*, from Sligo and Leitrim, are the most important records. We have to thank our correspondents for the many specimens, both fresh and dried, which they have forwarded.

Chara fragilis, Desv.—Berks, 1883, *G. C. Druce*; Bucks, 1884, *G. C. Druce*; Hunts, 1883, *A. Fryer*; Northants, 1879, *G. C. Druce*; Derby, 1883, *C. Bailey*; Lancs. S., 1882, *H. Searle* (*Hb. Arthur Bennett*); Wigton, 1883, *G. C. Druce*; Lanark, 1875, *A. Mackindor*, comm. *A. Bennett*; Easterness (Nairn), 1884, *J. G.*; Westerness, 1884, *E. F. Linton* (*Hb. Bennett*); Dumbarton, 1881, (*Hb. Bennett*); Ross W., 1883, *C. Bailey*; Waterford, 1882, *G. Nicholson*; Clare, 1884, *S. A. Stewart*; Sligo, 1884, *R. M. Barrington*.

var. *barbata*.—Antrim, *W. Thompson* (in *Hb. S. A. Stewart*).

var. *capillacea*.—Galway W., 1875, *A. G. More*.

var. *Hedwigii*.—Cambs. and Hunts, 1883, *A. Fryer*; Oxon, 1883, *G. C. Druce*; Sligo, 1884, *R. M. Barrington*.

var. *Sturrockii*.—By a clerical error the locality was omitted from our account of this variety (Journ. Bot. 1884, p. 2). It was collected in a small loch near Blairgowrie, Perth E., 1883, *A. Sturrock*.

C. aspera, Willd.—Hunts, Ramsey S. Mary, 1884, *A. Fryer*; York N.W., Wensley Dale, 1884, *J. Percival*, comm. *C. Bailey*; Isle of Man, 1881, *R. Wood* (*Hb. Bennett*); Perth M., Ochtertyre Loch, near Crieff, 1884, *A. Sturrock*; Easterness, near Nairn, 1884, *J. G.*

var. *subinermis.* — Sligo, Loughgill R., 1884, *R. M. Barrington*; Leitrim, Glenade Lake, 1884, *R. M. Barrington.*

C. POLYACANTHA, Braun. — Suffolk E., Bressinghan Fen, 1883, *G. C. Druce.*

C. CONTRARIA, Kuetz.—Hunts, Earith, 1883, *A. Fryer*; Northants, Peterborough, 1884, *G. C. Druce*; Cheshire, New Brighton, 1884, *H. Searle*; Westmoreland, 1863, *W. M. Hind* (in *Hb.* Trin. Coll. Dublin); Ebudes, N., Bradford, Skye, 1884, *E. F. Linton* (*Hb. Bennett*); Dublin, Glasnevin, 1882, *D. McArdle* (in *Hb.* Bot. Garden, Dublin).

var. *hispidula*, Braun, Schweiz. Charac. p. 16.—Cheshire, New Brighton, 1884, *H. Searle.* This form is distinguished by its larger size and prominent spreading spine-cells.

C. HISPIDA, L. — Hunts, 1883, *A. Fryer*; Lancs. S., 1884, *H. Searle*; Easterness (Nairn), 1884, *J. G.*; Limerick and Clare, 1884, *S. A. Stewart.*

var. *rudis.*—Salop, Crosemere, 1884, *H. Franklin Parsons.*

C. VULGARIS, L.—Berks, 1882, *G. C. Druce*; Lincoln N., 1884, *H. Searle* (*Hb. Bennett*); Haddington, 1884, *A. Craig Christie*; Easterness (Nairn), 1884, *J. G.*; Meath, 1879, *C. Bailey* (*Hb. Bennett*); Sligo, 1870, *A. G. More.*

var. *longibracteata.*—Essex S., 1884, *J. English*; Oxon, 1883, *G. C. Druce*; Bucks, 1884, *B. Piffard*, comm. *J. Saunders*; Hunts, 1884, *A. Fryer*; Worcester, 1883, *W. F. Towndrow*; Leicester, 1843, *J. Brewin, jun.* (in *Hb. F. T. Mott*); Lancs. S., 1882, *H. Searle*; York M.W., 1884, *T. Hebden*; Sligo, 1884, *R. M. Barrington*; Antrim, 1857, *W. M. Hind* (in. *Hb.* Trin. Coll. Dublin).

var. *papillata.*—Berks, 1882, *G. C. Druce*; Oxon, *G. C. Druce*; Bucks, 1884, *B. Piffard*, comm. *J. Saunders*; Suffolk E., 1883, *G. C. Druce & Bolton King*; Anglesea, 1884, *C. Bailey*; Lancs. S., 1883, *H. Searle*; Easterness (Nairn), 1884, *J. G.*

var. *crassicaulis.*—Derby, Monsal Dale, 1884, *W. Pullinger.*

C. CANESCENS, Loisel.—Cornwall, W., pool between Helston and the Lizard, 1884, *J. Guardia & H. G.* The rediscovery of this species in W. Cornwall is very interesting, as it seems to have disappeared from the original Falmouth locality.

LYCHNOTHAMNUS STELLIGER, Braun. — Devon S., pool, Slapton Sands, 1884, *H. G.*; found growing sparingly with *C. fragilis* var. *Hedwigii* and *C. connivens.*

TOLYPELLA GLOMERATA, Leonh.—Suffolk W., Lakenheath, 1880, *G. C. Druce & Bolton King*; Cheshire, New Brighton, 1884, *H. Searle*, a form with extremely long sterile branchlets; Sligo, Glencar Lake, 1884, *R. M. Barrington*; Leitrim, Glenade Lake, 1884, *R. M. Barrington*, a few scraps in a specimen of *C. aspera.*

T. PROLIFERA, Leonh.—Cambs. and Hunts, near Benwick, 1884, *A. Fryer.*

In 'English Botany,' ed. 3, vol. xii., p. 189, Mr. N. E. Brown writes:—"The plant collected by Mr. D. Moore in the grand canal, Glasnevin, Dublin, has been wrongly referred by Messrs.

Groves to *N. prolifera*; it belongs to *N. intricata*, as the sterile branchlets are branched, and not simple as in the var. *prolifera*, which has not yet been found in Ireland." If Mr. Brown had taken the trouble to read further on the same page of our 'Review,' he would have found that both species occurred at Dublin, and would not have blundered into such a self-confident misstatement.

T. intricata, Leonh.—Northampton, Yardley Gobion, 1879, *G. C. Druce.*

Nitella translucens, Agardh.—Cornwall E., Lanlivery, 1884, *R. V. Tellam*; Staffs., Rudyard Lake, 1884, *H. Searle*; Kirkcud bright, Tongland, 1884, *F. R. Coles*, a very stout form; Stirling, Airthrey Loch, 1884, *R. Kidston.*

N. flexilis, Agardh.—Sussex E., Copthorn, 1883, *A. Bennett*; Stirling, Airthrey Loch, 1884, *R. Kidston*; Fermanagh, Rossford Point, 1837, *W. Thompson* (in *Hb. A. G. More*).

var. *crassa*.—Perth Mid., Ben-y-beg and Balloch Lochs and Blair Drummond Pond, 1884, *R. Kidston*, *A. Sturrock*, and *F. Buchanan White.*

N. opaca, Agardh.—Bucks, 1884, *J. G.*; Suffolk E., 1799, *D. Turner* (in Linn. Soc. Herb.); Suffolk W., 1883, *G. C. Druce*; Westmoreland (Lake Lancs.), 1884, *T. Hebden*; Berwick, 1881, *Renton* (*Hb. Bennett*); Stirling, 1884, *R. Kidston*; Ebudes N., 1884, *E. F. Linton*; Ross W. and Ross E. (Cromarty), 1881, *G. C. Druce*; Waterford, 1882, *G. Nicholson* (*Hb. Bennett*); Armagh, 1874, *S. A. Stewart* (in *Hb. More*); Londonderry, 1839, *W. Thompson* (in *Hb. More*). We have received from Mr. Fryer specimens of a *Nitella* from Cambridgeshire, which is apparently a monœcious form of this species. Mr. Fryer informs us that in early spring the plant only produced globules, later on both globules and nucules, and in the summer principally nucules. We should be glad if our correspondents will examine any forms of *N. opaca* that they may find, to see if this is an isolated case.

Correction.—In our Review the bulbils of *Chara fragilis* and *C. aspera* are erroneously described as calcareous; their principal contents are starch granules.

A CONTRIBUTION TOWARDS A FLORA OF BRECONSHIRE.

By W. Bowles Barrett, F.L.S.

(Continued from p. 44).

Trifolium pratense L., and *T. repens* L. C. — *T. medium* L. Cwm Tarell; *A. Ley.* Bank, Pontsticil. I also observed it near Rhymney Bridge Station, just over the county border. **T. arvense* L. Side of railway, Three Cocks Junction.—*T. hybridum* L. Near Newbridge, introduced; *A. Ley.* — *T. fragiferum* L. Not seen. **T. procumbens* L. C.—*T. minus* L.; *A. Ley.*—**T. filiforme* L. Mynydd Troedd; *H. N. Ridley.*

Lotus corniculatus L., and *L. major* Scop. C.

Vicia hirsuta Koch. F. — *V. tetrasperma* Mœnch. Railway bank, Doldowlod; *A. Ley.* Searched for, not seen by me.—*V. Cracca* L. C.—*V. Orobus* DC. Trecastle Woods; *Herb. Brit. Mus.* Brecon; near Newbridge; *A. Ley.*—*V. sepium* L. C. Widely distributed.—*V. sativa* L. Top. Bot., ed. ii. — *V. angustifolia* Roth. Not seen. Var. b. *Bobartii.* Near Brecon; *Miss Fryer.* — *V. Bithynica* var. *angustifolia.* Near Brecon; *Miss Fryer.*

Lathyrus pratensis L. C. No other *Lathyrus* seen.

Orobus tuberosus L. Doldowlod; *A. Ley.* Priory Groves, Brecon; *Miss Fryer.* Gilwern. Near Garth.—Var. b. *tenuifolius.* Near Builth; *A Ley.*

Prunus spinosa L. Elan Valley; *A. Ley.* — **P. insititia* L. Near Llanhamlach. — *P. domestica* L. Cwm Tarell; *A. Ley.* Near Builth, introduced. — **P. Avium* L. Wood near Vennyfach, 1½ mile from Brecon; *Miss Fryer.* — *P. Padus* L. Elan Valley; *A. Ley.*

Spiræa Ulmaria L. C.

Agrimonia Eupatoria L. F. in lowlands.

Sanguisorba officinalis L. A common weed; noted at Pen-y-wyllt, Rhymney Bridge Vale, Dolygaer, Garth.

Poterium Sanguisorba L. Pen-y-wyllt; *A. Ley.* Rare; not seen by me.

Alchemilla arvensis Scop. Nant-gwyllt; *A. Ley.* Apparently uncommon, and confined to the lowlands. Talybont. Garth. — *A. vulgaris* L. Llanwrthwl; *A. Ley.* A common weed on the uplands, but less so in North-west Breconshire; noted at Pen-y-wyllt, Rhymney Bridge Vale, Dolygaer, Talybont, Llangorse, Brecon, Garth, Builth. — *Var. b. *montana.* Frequent.

Potentilla Fragariastrum Ehrh., *P. Tormentilla* Schenk, *P. reptans* L., and *P. Anserina* L. C. — *P. procumbens* L. Lower Elan Valley; *A. Ley.*

Comarum palustre L. Not seen.

Fragaria vesca L. C.

Rubus Idæus L. Widely distributed. — *R. suberectus* Anders. Near Capel Coelbren; *A. Ley.* — *R. plicatus* W. & N. *teste* C. C. Babington. Wood near Pen-pont; *A. Ley.* — *R. affinis* W. & N. *C. C. Babington*, Top. Bot. ed. ii. — *R. Lindleianus* Lees. Pen-y-wyllt. Talyllyn. Brecon. Builth. — **R. discolor* W. & N. C. — *R. leucostachys* Sm. *C. C. Babington*, Top. Bot. ed. ii. — *R. macrophyllus* Weihe. *C. C. Babington*, Top. Bot. ed. ii. — *R. Kœhleri* Weihe, var. c. *pallidus. C. C. Babington*, Top. Bot. ed. ii. — *R. cæsius* L. *C. C. Babington*, Top. Bot. ed. ii. — *R. saxatilis* L. On limestone Crag-y-Rhiwarth, Pen-y-wyllt; *A. Ley.*

Geum urbanum L. F. — *G. rivale* L. Tarens (cliffs) in the Honddu Valley, Black Mountain; *A. Ley.* Vennyfach Rocks; *Miss Fryer.*

Rosa spinosissima L. Rare. Mountain Cliffs Taren r' Esgob, in the Honddu Valley; only one or two bushes; *A. Ley.* Nowhere seen by me. — *R. mollissima* Willd. Cwm Tarell. Mountain cliffs near Llanthony; *A. Ley.* — Var. approaching *cærulea.* Near Capel Coelbren, and near Brecon; *A. Ley.* — *R. tomentosa* Sm. Pen-y-wyllt, common and characteristic. Dolygaer and Taff-Vechan, frequent. Talyllyn, sparingly. Garth, one bush observed. Builth. Apparently becomes scarcer towards north and north-west. — *R. canina* L., var.* a. *lutetiana* Leman. F. — Var. d. *senticosa* Ach., *teste* J. G. Baker. Near Brecon; *A. Ley.* — Var.* e. *dumalis* Bechst. Very C. — Var. g. *urbica* Leman. Near Brecon; *A. Ley.* Hay. — Var. t. *Reuteri.* Godet. By the Usk above Brecon; *A. Ley.* — Var.* u. *subcristata* Baker, *teste* W. M. Rogers. Near Dolygaer Reservoir. — Var. x. *coriifolia* Fr., *teste* J. G. Baker. Hedge near Brecon; *A. Ley.* — Var.* y. *Watsoni* Baker, *teste* J. G. Baker. Bank of Wye, near Hay Church.—**R. arvensis* Huds. Remarkably common throughout the county. — Var.* b. *bibracteata* Bast. F. Noted at Brecon and Builth. — *R. micrantha* and *stylosa* searched for but not seen.

Cratægus monogyna Jacq. C.* for segregate. A form with slightly woolly fruit (perhaps *C. villosa* Breb., Fl. de la Normandie), at Pen-y-wyllt.

Pyrus rupicola Syme, E. B. Observed on only a single Taren in the Honddu Valley, just on the borders of Brecon and Monmouth; *A. Ley.* — **P. Aucuparia* Gaert. C., and widely distributed on the uplands. — *P. Malus* L., var.* b. *mitis.* F.

Lythrum Salicaria L. Capel Coelbren; *A. Ley.* Near Llangorse Lake. Reported from all the adjoining counties, but rare in Breconshire. *Peplis* not seen.

Epilobium angustifolium L. Lower Elan Valley; *A. Ley.* F. on railway banks, Dolygaer, &c.—*E. hirsutum* L. C.—*E. parviflorum* Schreb. F. — *E. montanum* L. The commonest species: at Dolygaer with pure white flowers; a similar variety has been reported from South Devon. — *E. obscurum* Schreb. Generally distributed both on lowlands and mountains. — *E. tetragonum* L. Not seen. — *E. palustre* L. C. Widely distributed.

Circæa lutetiana L. Widely distributed. — *C. alpina* L. By the Wye near Erwood; *A. Ley.*

Myriophyllum spicatum L. Ditches near the Usk, Brecon. The Wye at Hay. — **M. alterniflorum* DC. The Usk, Brecon.

Callitriche stagnalis Scop. C. — **C. hamulata* Kütz. River at Dolygaer. Llangorse. Brecon.

Bryonia dioica L. Near Three Cocks Junction; *A. Ley.* Not seen by me.

**Ribes Grossularia* L. Wood near Gilwern. Three Cocks Junction. Probably introduced.

Sedum Rhodiola DC. In abundance on the northern precipices of the Brecon Beacons, alt. 2800 feet. Affirmative answer to query in Top. Bot.; *A. Ley.* — *S. Telephium* L. Bank near Newbridge; *A. Ley.*—Var.* a. *purpurascens.* Hedgebank, Pen-y-wyllt. Stone bank Alltmawr, near Builth. — *S. anglicum* Huds. Riverside rocks, Erwood; *A. Ley.* — *S. acre* L. Not seen, except rarely on garden-walls and other suspicious places: no other *Sedum* seen by me. — *S. reflexum* L.; *A. Ley.* Not native. — *S. Forsterianum* Sm., var. *virescens.* Northern precipice of Brecon Beacons; on rocks by the stream Cwm Serre, one and a-half miles north of the Beacons; *A. Ley.*

Cotyledon Umbilicus L. Lower Elan Valley; *A. Ley.* Apparently rather scarce in extreme South Breconshire: F. elsewhere. Pen-y-wyllt. Near Talybont, abundant. Llangorse. Brecon. Builth.

Saxifraga oppositifolia L. Craig-y-gledsiau in Cwm Tarell Valley, plentiful; northern precipices of Brecon Beacons, plentiful; *A. Ley.* — *S. tridactylites* L. Not common, and showing decided local tendencies. Talyllyn. Brecon. Hay. — *S. granulata* L. Vennyfach Rocks, near Brecon; *Miss Fryer.* — *S. Sponhemica* Gmel. Taren r' Esgob Black Mountain, native, well-marked and plentiful; *A. Ley.* Churchyard wall, Taff-Vechan, introduced.—*S. hypnoides* L. Very frequent throughout the Black Mountain district, in various forms; Craig-y-gledsiau, Brecon Beacons; *A. Ley.*

Chrysosplenium oppositifolium L. C. throughout. — *C. alterniflorum* L. Very frequent in the Honddu Valley, Black Mountain district, especially near Capel-y-ffin; near Pen-y-wyllt; *A. Ley.* Priory Groves, Brecon; *Miss Fryer.*

**Hydrocotyle vulgaris* L. Bogs above Rhymney Bridge Station. Llangorse Lake. Epynt Hills, near Garth.

Sanicula europæa L. C. and widely distributed.

Helosciadium nodiflorum Koch. C.

Carum verticillatum Koch. Meadows near Coel Bren, abundant; *A. Ley.*

Ægopodium Podagraria L. Near Penteryn; *A. Ley.*

Bunium flexuosum With. Grwyne Valley; *A. Ley.* Near Priory Groves, Brecon; *Mrs. Fryer.*

Pimpinella Saxifraga L. C. — Var.* *dissecta* Retz. F.: noted near Rhymney Bridge Station and at Builth.

Sium angustifolium L. Llangorse Lake, abundant.

**Œnanthe fistulosa* L. Llangorse Lake, plentifully. This plant has not been recorded for South-west Wales subprovince, nor for Radnor nor Montgomery. — *Œ. crocata* L. C.

**Æthusa Cynapium* L. Bank of Wye, Hay.

Silaus pratensis Bess. Top. Bot. ed. ii. Not seen by me.

Angelica sylvestris L. C.

Pastinaca sativa L. Not seen.

Heracleum Sphondylium L. C.

Daucus Carota L. Remarkably scarce and local. Field at north end of Talyllyn railway tunnel. Field at Garth; in both places abundant.

Torilis Anthriscus Gaert. C. and widely distributed. — *T. infesta* Spr. recorded by Rev. A. Ley, and *T. nodosa* Gaert. not seen.

Chærophyllum sylvestre L. Near Pen-pont; *A. Ley.* Priory Groves, Brecon; *Miss Fryer.* — *C. temulum* L. C.

Myrrhis odorata Scop. In abundance in Grwyne-faur Valley, Black Mountain, and I believe a true native; *A. Ley.* Streamside above Rhymney Bridge Station.

Scandix Pecten-Veneris L. Recorded by Rev. A. Ley, not seen by me.

Conium maculatum L. Near Brecon; *A. Ley.* Not seen by me in the county.

Hedera Helix L. C.

**Cornus sanguinea* L. F. Noted at Llangorse, Three Cocks Junction.

Adoxa Moschatellina L. Frequent in the Honddu Valley, Black Mountain district; near Brecon; *A. Ley.*

Sambucus nigra L. F. — *S. *Ebulus* L. Banks by the Wye at Hay, in plenty; probably introduced.

Viburnum Opulus L. Cwm Tarell; *A. Ley.* Llangorse, frequent. Builth.

Lonicera Periclymenum L. C.

Galium boreale L. Top. Bot. ed. ii.; not seen by Rev. A. Ley or myself. — *G. Cruciata* With. C. throughout. — **G. verum* L. Apparently scarce; only seen at Pentwyn. — **G. Mollugo* L., var. a. *elatum.* Talyllyn. — *G. saxatile* L. C. — *G. sylvestre* Poll. Craig-y-Rhiwarth, Pen-y-wyllt; *A. Ley.* — *G. palustre* L., var. b. *elongatum.* Near Brecon; *A. Ley.* — Var.* c. *Witheringii.* — *G. Aparine* L. Less common than in South-west England.

Asperula odorata L. Near Builth; *A Ley.* Apparently rare.

Sherardia arvensis L. Partricio; *A. Ley.* Near Brecon; *Miss Fryer.*

Valeriana dioica L. Taren r' Esgob; *A. Ley.* — *V. officinalis* L., var. b. *sambucifolia.* C.

**Valerianella Auricula* DC. Roadside, Builth. No other *Valerianella* seen.

Dipsacus sylvestris L. Not seen; appears to be rare in Wales, except in the extreme southern and northern counties.

Scabiosa succisa L. Very C. — *S. columbaria* L. Craig-y-gledsiau; Brecon Beacons (sandstone); Limestone rocks, Craig-y-Rhiwarth, Pen-y-wyllt; *A. Ley.* — **S. arvensis* L. C.

**Carduus nutans* L. Only once seen, near the Usk, between Brecon and Dinas; a single plant: rare in South-east and Mid Wales. — *C. crispus* L. Scarce, and always in small quantity. Talybont. Near Llanhamlach. Brecon. Three Cocks Junction. Hay. — *C. lanceolata* L. C. — *C. palustris* L. Very C. — *C. pratensis* Huds. *E. Forster, MS.*, Top. Bot. ed. ii. Moist mountain meadows east of Coel Bren, in abundance: one plant of a hybrid, *pratense-palustris,* with it; *A. Ley.* — *C. arvensis* Curt. Very C.

Carlina vulgaris L. Pen-y-wyllt; *A. Ley.* Rare: only seen on hillside near Pen-y-wyllt Station, very sparingly.

Arctium minus Schkuhr. Widely distributed, but less common than in South-west England. —**A. intermedium* Lange. F. about Talybont. Hay. No *majus* seen.

Serratula tinctoria L. Cwm Tarell; A. *Ley.* Local. Pen-y-wyllt. About Garth, abundant.

Centaurea nigra L. The type remarkably abundant throughout the county. The rayed form of the type, *radiata,* not seen. I carefully searched for var. *decipiens*, but failed to find a single specimen. No other *Centaurea* seen.

Chrysanthemum segetum L. Oatfield, Llanwrthwl; *A. Ley.* Scarce. Cornfield, Llanhamlach, in small quantity. — *C. Leucanthemum* L. F.

Matricaria Parthenium L. F. about towns and villages: introduced. — *M. inodora* L. Near cottage, near Nantgwyllt; A. *Ley.* Near Brecon; *Miss Fryer.* Not seen by me. — *M. Chamomilla* L. is probably absent

**Tanacetum vulgare* L. Gilwern. By the Wye, Hay; abundant. Banks of Wye opposite Aberedw.

**Anthemis Cotula* L. F., but less common than in South-west England. No other *Anthemis* seen.

Achillea Millefolium L. C. — *A. Ptarmica* L. C., and in some parts abundant, but becoming scarcer in the South-west of the county.

Artemisia Absinthium L. Near Three Cocks Junction. Native? *A. Ley.* — **A. vulgaris* L. C., and widely distributed.

Filago germanica L. Near Brecon; *Miss Fryer.* — *F. minima* Fries. Railbanks, Doldowlod, a casual; *A. Ley.* I saw no *Filago* in the county.

Gnaphalium uliginosum L. F., and widely distributed. No other *Gnaphalium* seen. — *G. dioicum* L. Top. Bot. ed. ii. In small quantity on the summit of Craig-y-Rhiwarth, Pen-y-wyllt; *A. Ley.*

Senecio sylvaticus L. Llanwrthwl; *A. Ley.* Rare. Hedgebank, Dolygaer. — *S. vulgaris* L., *S. Jacobæa* L., and *S. aquaticus* Huds., C. No *S. erucifolius* L. seen.

**Bidens cernua* L. Llangorse Lake, remarkably abundant. — **B. tripartita* L. Llangorse Lake, abundant. *B. cernua* and *tripartita* seem to be rare in South-east and Mid Wales.

Inula Helenium L. Near a cottage, Capel Coelbren, introduced; *A. Ley.* —**I. dysenterica* L. F. Gilwern. Llangorse, &c. — *I. Conyza* DC. Not seen.

Bellis perennis L. C.

Solidago Virgaurea L. F., especially in South Breconshire. Pen-y-wyllt. Gilwern. Brecon. Hay. Garth. Builth. — Var. *angustifolia.* Near Newbridge; *A. Ley.*

Tussilago Farfara L. Priory Grove, Brecon; *Miss Fryer.*

Petasites vulgaris Desf. Remarkably abundant and widely distributed.

Eupatorium cannabinum L. F., and widely distributed.

Since the first portion of this paper was published (Journ. Bot. Jan. 1885), Mr. Alfred Fryer has kindly communicated to me some additional plants, as also new localities, observed by Mrs. Fryer and Miss Fryer between 1882 and 1884; all the specimens have been examined by Mr. Fryer. The total records for Breconshire are thus brought up to 595 species. Except the following, which properly belong to the first part of this paper, Mr. Fryer's communications have been embodied in the text:— *Trollius* *europæus* L. Vennyfach Rocks, near Brecon. — *Fumaria confusa* Jord. Brecon. — **Raphanus Raphanistrum* L. Field by the Usk, Brecon. — *Cardamine pratensis* L. Priory Groves, Brecon. — *Arabis thaliana* L. On wall, Brecon. — *A. hirsuta* Br. On wall, Brecon. — **Nasturtium sylvestre* Br. Vennyfach Rocks, 1884. — *Viola odorata* L., var. *alba*. Vennyfach Rocks, probably an escape. — *Hypericum dubium* Leers. Crug Lane and field by the Usk, near Brecon. — *Geranium lucidum* L. Brecon.

(To be continued.)

SHORT NOTES.

Hemerocallis flava naturalised in Wales.—In one of the sea-coast woods at Penrhyn Castle this plant has now become quite naturalised, large patches of from 600 to over 1000 plants in each occurring in several parts of the wood and at considerable distances apart. The wood in which they are found runs nearly at right angles to the Menai Strait, the first patch of the *Hemerocallis* being within 20 yards of the sea, the second 370 yards farther along, and the third, which contains the greatest number of plants, 200 yards from the second. I am rather puzzled to account for the appearance and distribution of the plant, more particularly the latter, as, strange to say, although I have watched it carefully for the past seven years, no flowers have been produced, although the plants are remarkably strong and vigorous, so that its dissemination by seed is out of the question. Previous to the formation of that part of the park in which the plant abounds (about 100 years ago), I see from an old map or plan that three farm-houses stood at or near where the clumps occur; so that it is but reasonable to suppose that the plant was introduced to one of the gardens attached to the farm-houses, and from which roots would no doubt, as is very commonly the case even now, be distributed amongst the others. This explanation is not at all improbable, as the plant was introduced from Siberia as early as 1596. I am not aware that elsewhere in Britain has the *Hemerocallis* become established in such quantity; indeed, in a letter from Sir Joseph Hooker he considers the case as very remarkable and well worth recording, although, as he says, considering what a vigorous rooter the plant is, it is a wonder it has not established itself elsewhere.—A. D. Webster.

Erica Tetralix in the Faroe Islands.—Mr. J. Backhouse, Jun., of York, during a short visit to the Faroes last September, gathered this heath at Trangisvaag, in Suderöe. It is an addition to Rostrup's 'Flora of the Islands,' and interesting, as all our three common heaths are now on record for these isles; while *E. cinerea*, although recorded for Iceland by Solander and Mörck, is not admitted by Babington (Rev. Fl. Iceland) or Gronlund (Fl. of Iceland). Suderöe is the southernmost isle of the group, and Trangisvaag is at the head of a deep "fiord" of the sea.—Arthur Bennett.

NOTICES OF BOOKS.

Plantæ Davidianæ ex Sinarum Imperio. Par. M. A. FRANCHET, Attaché à l'Herbier du Muséum. Première partie. Plantes de Mongolie, du Nord et du Centre de la Chine. Avec 27 Planches. Paris: G. MASSON, 1884. 4to, pp. 390. Reprinted from the 'Nouvelles Archives du Muséum.'

AFTER having lain for about ten years in the herbarium of the Paris Museum, the Chinese botanical collections of the Abbé Armand David have been at last taken in hand by M. Franchet, and the name of the author of the 'Enumeratio plantarum in Japonia' is a sufficient guarantee for excellent work in the publication before us.

The Abbé David was for a long time attached to the Lazarist Mission in Peking, where he had an opportunity of collecting most of the species of North China and of adjacent Mongolia. Afterwards, under a commission from the French Minister of Public Instruction, he travelled widely through Central and Western China, and spent some nine months in Eastern Thibet. During these explorations his attention was chiefly given to Zoology, but he botanized as well, although he says that his collections must be regarded only as samples of the rich flora of these regions.

The total collections, according to M. Franchet, represent over 1500 species. The importance of the present volume, which deals exclusively with plants from Mongolia and Northern and Central China, is shown by its enumeration of 1143 species, of which about 950 are recorded from China proper, while 64 are new to science.

The enumeration is prefaced by a most interesting letter from the Abbé David, giving a rapid sketch of his travels from a botanical point of view, with some account of the relation of the flora to the geological structure of the country traversed.

For the purposes of natural history Abbé David divides the Chinese Empire into three great regions:—I. North China, extending from the Yellow River to the borders of Manchuria. II. Eastern Mongolia, adjoining the Great Wall. III. The whole of the generally mountainous country which forms South China, including the enormous basin of the Yangtsze River.

The first and second regions are very similar in their fauna and flora, as well as in their climate, the characteristics of which are:—1st, Great dryness, with some storms in summer, but with little rain or snow during the rest of the year, and without heavy dews until early July after the first showers. 2nd, A sky usually clear, with frequent and disagreeable northerly winds. 3rd, Regularity of the seasons, the summer heat and winter cold being rarely disturbed by sudden changes of temperature. 4th, A long, very hot summer, and a rigorous winter. At Peking the great cold sets in, almost without a transition, in November, and the river and sea-coast are closed by ice from early December to March. In summer the thermometer often rises above 105° Fahr. in the shade, while the minimum winter temperature oscillates between 20° and 10° Fahr. It is, however, sometimes 15° lower, and in Mongolia cold of 25° below zero is not uncommon.

While therefore no plants from warm countries can survive the Peking winter, many tropical annual species can be cultivated far to the north. Bamboos, for instance, which thrive on all the mountains of South China, are not found in a wild state north of the Yellow River; and, on the other hand, rice, sesame, cotton, sweet potatoes, &c., are successfully grown up to the borders of Manchuria. Again, the two or three (doubtless introduced) varieties of the grape-vine, which are cultivated near Peking, have to be completely covered with earth every winter.

The climate of the provinces south of the Yangtsze River is subtropical, with frequent rains throughout the year, less however, in winter than in summer. Vegetation therefore is much more luxuriant than in the north, but without being varied. Abbé David alludes to the close connection between the flora of Kiangsi, Kiangnan and Chekiang and that of Japan, a fact which has been already established, while the relations of the Southern provinces to Cochin China and India have yet to be worked out.

One of the greatest evils with which China has now to contend is the result of the forest devastation which has gone on for centuries, either for the purpose of clearing ground for agriculture or for the sake of the timber. Abbé David further suggests that, as the tiger and the leopard once roamed through the forests, human life could not have been safe in their neighbourhood, especially for people who kept but few cattle; and that the destruction of the haunts of these wild beasts may have been resorted to as a means of exterminating the pests. At all events the timber has practically disappeared from the mountains and hills of China, and Abbé David says that it is only on almost inaccessible slopes that remains of old forests are to be found. It must have been only from inadvertence that he has omitted to mention the neighbourhood of Buddhist monasteries and temples as among the few places where the native tree vegetation of China is still preserved. This fact has been pointed out by Dr. Hance in more than one place in this Journal,* and although more especially referring to the Southern provinces, his observations are none the less true regarding other parts of China further north, as the writer of this notice is able to testify.

The Abbé David's preface contains a long and highly interesting account of Moupine, a small quasi-independent state of Eastern Thibet, where this zealous naturalist spent nine months and whence came his most remarkable zoological novelties. The word "Moupine," according to Abbé David, signifies "wooded plain," a name which, he adds, must have been given ironically, as the whole district so bristles with mountain peaks that it must require an effort of imagination for the inhabitants to realize what a plain means. In this range there are several snow-capped mountains, loftier even than the one which he himself ascended, and which he found to be 16,500 feet in height. The slopes here are still thickly wooded up to 11,500 feet. The climate is hard and disagreeable, damp and very foggy. The winters are cold, with much snow, which remains in sheltered valleys till May or June. During the rest of the year it rains almost every day, and the atmosphere is so charged with moisture that, according to the inhabitants, a gun shot will bring on a shower in calm weather!

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*Journ. Bot. 1870, pp. 274, 275; 1878, pp. 6, 7, 8.

Such a climate is naturally favourable to the growth of plants like ferns, conifers, and rhododendrons. The latter are the woody plants found at the greatest altitude, and fifteen to twenty species were observed, which with their magnificent flowers gave a charming aspect to the landscape from April to July. At Moupine Abbé David saw a number of trees, unknown to him and probably new species, which with rhododendrons, box, aralias, and bamboos, form impenetrable thickets, the home of the Amherst Pheasant. Here, at an altitude of 6500 feet, was found the curious tree named *Davidia* by Baillon,* growing with a fine species of cherry, a gigantic hazel, an oak with cork bark, and various *Laurineæ*. Many species of *Ficus* were met with, some of them large trees, others tall climbers, and one a creeper, with good-sized, very sweet fruits, which are only produced on those parts of the plant that are hidden under the sand or stones. It was here also that Abbé David found the pyramidal poplar, unknown in the rest of China, and the weeping willows are spoken of as the finest he had ever seen. Besides the ordinary tea-plant, another species called "White Tea" is also cultivated at Moupine and in Szechuen. It is a taller shrub than the common kind, with elongated and somewhat downy leaves.

As to the herbaceous flora of Moupine, although proportionately less rich than the arborescent, it is far more interesting than in North China, where monotony is the prevailing characteristic. It is also to be noted that the few European genera and species represented in the northern flora no longer appear in Thibet, except as introduced plants. To conclude this notice of Moupine, a curious circumstance mentioned by Abbé David may be quoted in his own words:—"When the virgin forests are burned to make agricultural clearances, the denuded land produces spontaneously, among other plants, a great quantity of *Sinapis* with oleaginous seeds, of which the natives gather two or three good crops without any trouble. As this species of *Sinapis* (which is largely cultivated throughout China) is never found in the woods, it may well be asked whence and when came these seeds which have retained their germinating power for an incalculable number of years?"

Turning to the systematic part of the book, we have space only for a few notes that have suggested themselves during a cursory examination of its pages.

We observe with interest that *Clematis Davidiana* Dcne. is considered only a variety of *C. tubulosa* Turcz., which the present writer has shown to be reducible to *C. heracleifolia* DC.[*] M. Franchet has followed M. Maximowicz in this decision, which he bases not only on the wild specimens brought home by Abbé David, but upon his own study of the plants under cultivation in Paris.

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* Adansonia X. 114. Placed by Baillon provisionally in *Combretaceæ*. Hist. des Plantes, vi. 282.

Ranunculus ternatus Thbg. is a species about which there has been some confusion. Thunberg's original diagnosis (Fl. Jap., p. 241) was very meagre, but DeCandolle, in 1817 (Syst. i. p. 242), carefully described the plant, apparently after an authentic specimen in Delessert's herbarium. In 1824 Wallström (Dissert. Pl. Jap.) figured a plant, presumably from Thunberg's herbarium in Upsala, with the name of *R. ternatus*, but without description. The name, as applied by DeCandolle, was adopted by Prof. Asa Gray (Bot. of Japan), by Siebold and Zuccarini (Fl. Jap. Fam. Nat.), by Miquel, who gave a detailed description (Prol. p. 192), and by Franchet and Salvatier (Enum. pl. Jap. i. 7). The latter authors further (*l. c.* ii. 268) suggested that Wallström's figure was identical with *R. Zuccarinii* Miq., but M. Maximowicz (Fragmenta, p. 3), while confirming this, claimed that the plate must be taken to represent the true *R. ternatus* of Thunberg, and that DeCandolle's description was referable to *R. japonicus* Langsdorff (non Thbg.). M. Franchet now sums up the discussion in a way that appears to me to set it at rest:—"Je ne puis partager l'avis de M. Maximowicz: de Candolle a très suffisamment décrit la plante sur *un specimen authentique*, et il la compare au *R. aconitifolius*, dont le *R. Zuccarinii* est très différent: il n'est pas admissible de faire prèvaloir la figure de Wallström, assez mauvaise du reste et donnée sans description, contre le texte précis de l'auteur du 'Systema.'"

Myosoton aquaticum Mœnch, is the name under which M. Franchet presents to us our old friend *Malachium*. The genus here taken up is noticed neither in the 'Prodromus' nor in the 'Genera Plantarum,' although quoted as a synonym by both Endlicher and Steudel. As Mœnch's name (Methodus, p. 225) dates from 1794, while Fries's *Malachium* was not established till 1817, it would seem that M. Franchet must be followed by those who are not satisfied with the *Stellaria aquatica* sanctioned by Bentham and Hooker.

In adopting *Camellia theifera* Griff. as the name for *Thea sinensis* Linn., I presume M. Franchet has followed the authors of the 'Flora Indica' (vol. i. p. 292), but I am at some loss to understand why, in both works, Link's earlier and better name of *Camellia Thea* should have been unnoticed and superseded.[†]

The beautiful *Xanthoceras sorbifolia* Bge., which is commonly cultivated about Peking, appears to have been found growing wild only on the rocky ranges of Ourato, in Mongolia, not far from the great northern bend of the Yellow River. Although it was reported to be wild near Jehol, Abbé David had only seen the tree in cultivation there. From Southern Shensi a new variety of *Sophora Moorcroftiana* Benth. is described. The typical form belongs to Northern India, and the species is remarkable in the genus for its habit, which approaches that of *Caragana* and *Halimodendron*. Very few Rubi or roses appear to have been collected. Among the latter are *Rosa Banksiæ* R. Br. from Southern Shensi, a plant with single flowers, but whose spontaneity appears doubtful, and *R. xanthina* Lindl. from Mongolia. Abbé David says:—"Ce joli rosier aux mille fleurs est excessivement abondant dans toute cette chaine de montagnes: j'en ai trouvé une variété curieuse, où toutes les anthères etaient réunies comme dans les Malvacées." There is a new *Crassula* from Jehol, this being, as far as we are aware, the first record of this genus from China; and a sterile specimen of *Hamamelis* from Kiukiang so resembles the Japanese plant that M. Franchet refers it also to *H. virginiana* L. Of *Compositæ* 115 species are enumerated, and among the seven new ones is a *Petasites* from Shensi, the first Chinese record of this genus. The Indian *Buddleia paniculata* Wall. is reported as abundant in Shensi, where *Thyrocarpus glochidiatus* Maxim., known previously from Kansu, was also found.

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[*] Journ. Bot. 1884, p. 263.

[†] *Camellia Thea* Link, Enum. Part II., p. 73 (1822). *C. theifera* Griff. Notul. IV., p. 558 (1854).

Quercus mongolica Fisch. is reduced to a variety of *Q. sessiliflora* Salisb., the numerous specimens collected by Abbé David having established this fact beyond doubt to M. Franchet. A new oak from Shensi is described by Abbé David as *Q. spinosa*, and another specimen from the same country is doubtfully referred to *Q. phyllirœoides* A. Gray, which was known only from Japan and the Liuchu Islands. Both specimens were sterile, and we should not be surprised to learn that, with further material in hand, both might be found referable to *Q. Ilex*. From Shensi there are specimens (unfortunately also sterile) referred to the long overlooked *Q. chinensis* Abel* (not Rob. Brown, as the author's name has inadvertently been given). A new *Castanopsis* is recorded from Kiangsi, making the eighth species peculiar to China. About a dozen *Coniferæ* are enumerated from Western China, several of which are described as new, while the material for others hardly appears to have been sufficient for specific determination.

Among the Monocotyledons there is not much that is new, but, as they amount to only seventeen per cent. of the phanerogams, they must be considered as rather poorly represented in the collections.

The volume itself is published with all the luxury of paper, type and plates to which we have been accustomed in the 'Nouvelles Archives du Muséum.' Still, at the risk of seeming ungracious where so much is of the best, we may venture to regret that there is nothing in the way of ordinal or generic names at the tops of the pages, to guide the eye in a rapid search through the volume. We may also remark that the types chosen to indicate specific names and varieties hardly appear distinct enough alongside the beautiful large print used for the localities and critical notes. One must also regret the absence of analytical keys to the larger genera, like the admirable ones which M. Franchet compiled for his 'Japanese Flora.' But, after all, these are minor details, and for the rest the distinguished author may well be congratulated on having produced a book which is the most important contribution to Chinese botany since the appearance of Bentham's 'Flora Hongkongensis.' FRANCIS BLACKWELL FORBES.

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* One of these specimens, kindly communicated by M. Franchet, agrees as far as it goes with Abel's description and figure. It appears very distinct from *Q. sclerophylla* Lindl., which I had thought might be identical with Abel's species, by the form and peculiar glaucous under surface of the leaves, as well as by the much larger greyish silky buds. *Vide* Journ. Bot. 1884, p. 82.

THE Fourth Annual Report of the Hampstead Naturalists' Club contains "a list of botanical species observed in the district," by Mr. Roland Ellis, the times of flowering being given. The list, however, is manifestly very incomplete.

THE first number of a new botanical serial, 'The Journal of Mycology,' edited by Messrs. Kellerman, Ellis, and Everhart, to be published monthly at the low cost of one dollar per annum, comes to us from Manhattan, Kansas. It contains papers on 'New Kansas Fungi,' by Messrs. J. B. Ellis and W. A. Kellerman; 'New Fungi from Iowa,' by Messrs. J. B. Ellis and E. W. Holway; and 'North American Geasters,' by A. P. Morgan; besides notices of other kindred publications.

MR. A. E. GIBBS publishes a useful list of Hertfordshire Mosses in the Transactions of the Herts Nat. Hist. Society (vol. iii. pt. 2), in which Mr. R. A. Pryor's division of the county into river-districts has been followed. We regret to learn that there seems little prospect of the publication of the new Flora of Hertfordshire, on which Mr. Pryor spent so much time and labour, and it seems right to state that the Editor of this Journal, to whom the work was originally entrusted, has for some time since been relieved of any responsibility for its production.

NEW BOOKS. — J. OLMEDILLA, 'Curiosidades acerca de las Plantas' (Madrid: 8vo. pp. vii. 159).—V. B. BROTHERUS, 'Études sur la distribution des Mousses au Caucase' (Helsingfors, Frenckell: 8vo, pp. iv. 104).—P. A. SACCARDO, 'Sylloge Fungorum': vol. iii., *Sphæropsideæ* and *Melanconieæ* (Padua: 8vo, pp. 860: 54 *fr.*). — C. V. NÄGELI & A. PETER, 'Die Hieracien Mittel-Europas: Monographische Bearbeitung der Piloselloiden der mitteleuropäischen Sippen' (Munich, Oldenbourg: 8vo, pp. xi. 932). — A. MEYER, 'Beiträge zur vergleichenden Anatomie der Ranunculaceen' (Marburg, Friedrich: 8vo, pp. vi. 50, 1 tab.). — E. DENNERT, 'Beiträge zur vergleichenden Anatomie des Laubstengels der Cruciferen' (Marburg, Friedrich: 8vo, pp. vi. 40, 1 tab.).

ARTICLES IN JOURNALS.

American Naturalist.—A. F. Foerste, 'Fertilisation of *Physostegia virginica*.'

Botanical Gazette (Jan.). — L. H. Bailey, 'Notes on *Carex*' (*C. nervina*, sp. n.).

Bot. Zeitung (Jan. 23). — C. Fisch, 'Ueber die Pilzgattung *Ascomyces*.'—(Jan. 30, Feb. 6, 13, 20). J. Reinke, 'Die Zerstörung von Chlorophylllösungen durch das Licht und eine Methode zur Erzeugung des Normalspectrums.'—(Feb. 6). A. Fischer, 'Ueber ein abnormes Vorkommen von Stäskekörnen in Gefässen.' — (Feb. 20). A. Hausen, 'Antwort auf die Berichtigung von Tschirch.'

Bot. Centralblatt (No. 5).—E. Ihne, 'Karte der Aufblühzeit von *Syringa vulgaris* in Europa.'—(No. 6). E. C. Hausen, 'Vorläufige Mittheilungen über Gährungspilze' (1 tab.). — (Nos. 7, 8). C. Kraus, 'Ueber Blutung aus parenchymatischen Geweben.' — (No. 8). T. Sterzel, 'Zur Culmflora von Chemnitz-Hainichen.'

Botaniska Notiser (Häft 1).—S. Murbeck, 'Några anteckningar till floran på Norges sydvestra och södra Kust.'

Flora (Jan. 1). — J. Velenovsky, 'Ueber die Achselsprosse einiger *Smilax*-Arten' (1 tab.). — J. Freyn, 'Phytographische Notizen' (*Muscari stenanthum* Freyn, *M. Schliemanni* Freyn & Aschers., *M. granatense* Freyn, *M. fuliginosum* Freyn, spp. nn.). — —. Röll, 'Ueber den Standort von *Rhynchostegium tenellum* Dicks.' — (Jan. 11). J. Freyn, 'Phytographische Notizen' (*Muscari laxum* Freyn, *Bellevalia Battandieri* Freyn, *B. variabilis* Freyn, spp. nn.). — (Jan. 21, Feb. 11, 21). O. Markfeldt, 'Ueber das Verhalten der Blattspurstränge immergrüner Pflanzen beim Dickenwachstum des Stammes oder Zweiges' (1 tab.). — W. Nylander, 'Addenda nova ad Lichenographiam europæam.' — (Feb. 1). F. Arnold, 'Die Lichenen des fränkischen Jura.' — (Feb. 11). J. Freyn, 'Phytographische Notizen' (*Bellevalia Boissieri*, n. sp.). — (Feb. 21). H. Braun, *Rosa Borbasiana*, n. sp.

Garden (Feb. 21).—Synopsis of the genus *Lilium*.

Gardeners' Chronicle (Feb. 7).—H. G. Reichenbach, *Masdevallia acrochordonia*. — *Peronospora Hyoscyami* (fig. 33). — J. D. Hooker, '*Cupressus macrocarpa*' (fig. 34). — (Feb. 14). W. O'Brien, '*Asplenium germanicum*.'—J. O'Brien, '*Satyrium nepalense*' (fig. 38). —(Feb. 21). *Maxillaria Kalbreyeri* Rchb. f., sp. n.—Buds on ends of leaves in *Curculigo* (fig. 49). — (Feb. 28). J. O'Brien, '*Cryptostylis longifolia*' (fig. 53).

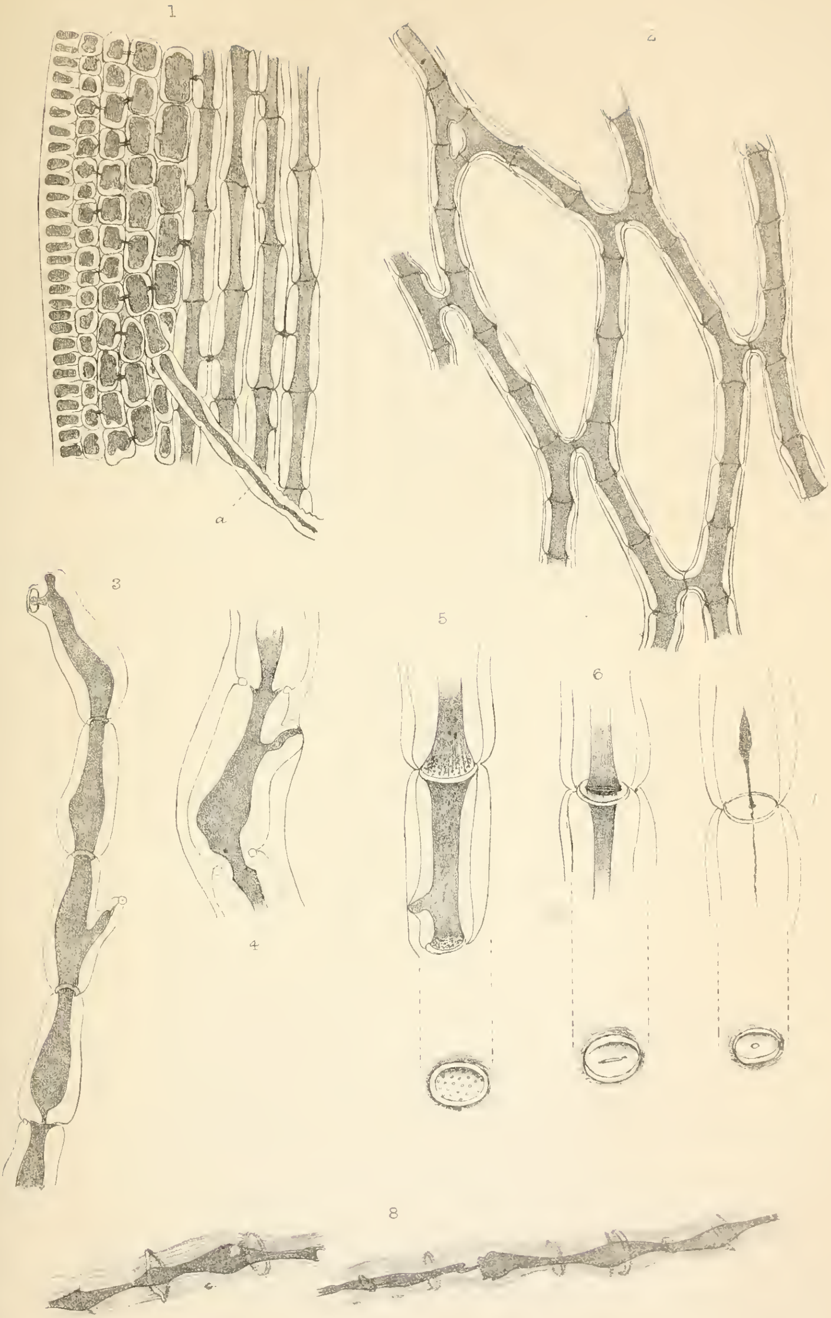
Midland Naturalist. — J. E. Bagnall, 'Flora of Warwickshire' (contd.: *Cyperaceæ*—*Gramineæ*).

Nature (Feb. 26).—W. Gardiner, 'The Continuity of the Protoplasm in Plant-tissue.'

Œsterr. Bot. Zeitschrift. — F. Leithe, 'Kryptogamenflora von Tirol.' — R. F. Solla, 'Pelagische Algen. — F. Strobl, 'Bluthenzeitdauer mancher Pflanzen.'

Pharmaceutical Journal (Feb. 14).—W. Kirkby, 'False Cubebs' (*Piper* sp.).

Tab. 255.



T Hick del.
R Morgan lith.

Ascophyllum nodosum

West Newman & Co imp.

PROTOPLASMIC CONTINUITY IN THE *FUCACEÆ.*

By Thomas Hick, B.A., B.Sc.

(Tab. 255.)

Previous researches* having shown that protoplasmic continuity obtains very widely in the *Florideæ*, the question very naturally suggested itself whether similar phenomena were to be met with in other groups of Marine Algæ, and especially in the *Fucaceæ*. To supply an answer to this question, a very careful investigation of the histology of the commoner Fucoids was undertaken, and the results of this form the basis of the present communication. I venture to think they conclusively establish the position that here too a continuity of protoplasm through the cell walls is in existence, which, though of a different type from that described in many of the *Florideæ*, is not less certain and definite.

As in the case of the *Florideæ*, the materials employed have been partly sun-dried and partly fresh, the former having been found in the majority of cases quite as demonstrative as the latter.

The methods of treatment adopted to render the arangements for continuity perceptible have varied somewhat, owing to the fact that the same treatment was not always equally successful with different plants. In general terms, the treatment was such as would either dissolve out the protoplasm from the tissues, or else swell up, gelatise, or dissolve the cellulose framework. Pigments of various kinds were also made use of for the usual purpose of differentiating and demonstrating different structures. The dissolution of the protoplasm was usually effected, without any difficulty, by dilute solution of common bleaching-powder. Greater difficulty was at first experienced in swelling the sections sufficiently to make clear the relation between the protoplasts and their envelopes. Schultze's solution and sulphuric acid, of themselves, were found to be of little use for this purpose, though so valuable in the manipulation of tissues from other plants. After a number of reagents had been experimented with, alkalies were found to be the most effective swelling reagents, and of these ammonia and carbonate of ammonia of various strengths were decidedly the most serviceable. When a greater or less amount of disintegration of the tissues was desired, the sections were treated successively with moderately strong sulphuric acid and strong ammonia. The various ways in which the reagents were employed need not be described in detail, but the following methods were so generally followed, and, as a rule, furnished such favourable results, that, for the guidance of those who may wish to verify the statements here set forth, they may be given in full.

A. To obtain a general view of the structure of the thallus of the plant under investigation, thin sections were placed in fresh water for a few minutes and then stained with methyl green, acidulated with acetic acid. After well washing with water or acetic acid, the sections were put for a short time—varying in different cases—into alum-carmine. They were again well washed with water, swollen with strong ammonia and mounted in glycerine. Sections prepared in this way turn out in a very pretty condition, the protoplasmic structures being coloured green, and the framework a pale pink or violet. Before swelling with ammonia the sections must be thoroughly washed, to remove all traces of alum, as otherwise the ammonia will cause a precipitate of aluminic hydrate to be thrown down.

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* British Association Report, 1883, p. 547. 'Journal of Botany,' February and March, 1884.

B. For the determination of more refined details, the sections were treated as follows:—Having been washed with fresh water, they were stained with an aqueous solution of saffranine; again washed with water and swollen with strong ammonia; and finally mounted in glycerine. Thus prepared, the sections showed the protoplasts of a pink colour and their envelopes yellow, deepening here and there to brown.

C. Still more satisfactory results were, however, obtained thus:—Sections were soaked for from 3 to 12 or 20 hours in a mixture of strong sulphuric acid, 1 part, and water, 3 parts. They were then washed, stained with saffranine as in the preceding process, and mounted in a mixture of glycerine and ammonia. If the ammonia is employed to swell the sections before mounting, they become so much disintegrated that it is then impossible to transfer them to a slide.

ASCOPHYLLUM NODOSUM Le Jolis. FUCUS NODOSUS L.

The frond of this Fucoid is so common and abundant on British coasts, and its appearance is so well known, that there is no need to give any description of its general morphology. It is only necessary to refer to the leading features of its histological structure.

In longitudinal sections of any part of the thallus, made perpendicular to the flattened surfaces and examined under the microscope, we may distinguish, with more or less clearness, an epidermis, a cortex, and a central or medullary tissue. Pl. 255, Fig. 1.

The *epidermis* is composed of a single layer of small cylindrical cells, averaging 0·0005 inch in breadth, and from 1½ times to twice this in length. They are placed with the long diameter perpendicular to the thallus, and are somewhat strongly cuticularised on the free surface. In the fresh state the lumen of the cells is filled with a dense, granular, brown-coloured protoplasm, and the walls appear of no great thickness. In the dried condition, the protoplasm is contracted, and the true thickness of the walls is obvious.

The *cortex* consists of 3, 4, or more layers of cells, of a somewhat more irregular shape than those of the epidermis,—the cells of each layer forming a longitudinal series. The cells in contact with the epidermis hardly measure more than 0·0005 inch by 0·0005 inch, but, passing from without inwards, the cells become larger and more elongated in the longitudinal direction, until they pass over into the filamentous tissue of the the centre. The cell walls attain considerable thickness, and the protoplasm is granular and of a brown colour. Towards the centre the colour becomes less pronounced, and almost or entirely disappears.

An important feature of the cortex is the presence of numerous lateral diverticula, which connect the cells of the successive layers transversely, so that the whole tissue forms a cell complex, whose elements are closely interconnected. The outermost cortical layer is connected in a similar manner with the epidermis.

The Central Tissue.—Towards the centre of the thallus the cortical cells pass over into long filaments with thick walls, which make up the major part of the central tissue. There is, however, no distinct line of separation between the cortex and this tissue. The filaments run for the most part longitudinally, and more or less parallel to one another. They are composed of cells, 0·001 inch in breadth and 0.003 inch in length, on an average, joined end to end, whose outer boundaries are usually lost in a gelatinous or cartilaginous matrix. The protoplasmic contents are very gaanular, but the brown colour of the outer parts of the thallus is nearly or altogether absent. Numerous transverse diverticula connect the filaments laterally with one another, and the outermost with the cortex, so that the whole has more or less of a reticulated appearance.

Beside the filaments that run longitudinally, the central tissue contains other structures of a more fibrous character. These arise from the cortical cells, curve inwards towards the centre of the thallus, and form a sort of "weft" to the filamentous "warp." They resemble the filaments in general appearance, but their walls are much thicker and the protoplasmic contents are correspondingly attenuated. Though very fibrous in aspect, they are made up of cellular elements, the transverse petitions being very oblique and not perpendicular to the side walls as in the filaments. Pl. 255, Fig. 1 (*a*). The walls of the fibres are very beautifully laminated, and exhibit a very peculiar annulation which the writer has not met with in any other group of plants. As shown in Fig. 8, it presents itself as a number of ring-like ridges developed on the *outer* surface of the fibre. It was at first imagined that these had some connection with the division of the cells, and the formation of the sieve-plates described below. But the rings formed round the sieve-plates are formed on the *inner* surface of the wall, the outer surface taking no part in their formation. Sometimes there are two, three, or more of these external rings pretty close together, but in others they are placed singly, at a distance from one another.

In good sections prepared by either of the methods A or B, or indeed by any process which ensures a slight contraction of the protoplasm, a suspicion of the existence of continuity will be created by the appearance of the cell-contents, both in the cortical and the central region. For in typical cases the contraction is for the most part *lateral* and not *longitudinal*, so that although the contents retire a little from the side walls of the cells, they usually remain uncontracted at the ends. Hence, in the cortical layers and in the filaments of the central tissue the protoplasm appears, under a half or quarter inch objective, to run uninterruptedly from cell to cell in the longitudinal direction. Pl. 255, Fig. 2.

Similar phenomena are met with in the lateral diverticula which unite the filaments and cortical layers transversely, the protoplasm *appearing* to run across without a break.

The fibres too, which are interwoven with the central filaments, *seem* to have their contents continuous from one end to the other.

A mere suspicion of continuity, however, is not sufficient to satisfy the demands of scientific logic, and to be convinced that it actually exists the state of affairs at the ends of the cells must be more closely investigated. For this purpose sections prepared by the third method described above must be made use of, and even these must be supplemented by others of a still more demonstrative character. The latter may be obtained by slightly modifying the modes of treatment as follows:—

1st. Sections that are to be treated by the second method should be previously placed for a few moments in a weak solution of ordinary bleaching powder.

2nd. Sections that have been treated by the third method should be warmed gently in a mixture of equal parts of glycerine and potash solution, before being mounted in glycerine and ammonia.

When thus dealt with, favourable preparations allow the following points to be demonstrated, both in the cortical and the central tissue.

(*a*) At the ends of the cells, *i. e.*, at the point where two adjacent cells are united, there is an annular thickening on the internal wall not unlike a strongly developed ring of an annular vessel. The material of which the ring is composed differs from that of the cell walls in not dissolving or undergoing gelatinisation under the influence of reagents. It seems to resist alike the action of the strongest acids and the strongest alkalies, as well as the disintegrating action of a solution of bleaching powder.

(*b*) Within this ring the arrangements are not the same in all cases, but for the most part they conform to one of four types.

(i.) In the first type the ring surrounds a comparatively wide and open pore, through which the protoplasm is continuous in a single thread. This type is not very common, but isolated instances are here and there to be met with. (Pl. 255, Figs. 3 and 4). Grave doubts having been expressed respecting the existence in other plants of this type of continuity, special care has been taken to prevent error on this point, which is admittedly of great importance. The result is, that in the mind of the writer there is perfect conviction that the description is in strict accordance with the actual facts. In one extremely favourable preparation, the thick ring is presented in section at both ends of a cell, and the connecting cord of protoplasm is seen *in situ*, running through the pores thus formed. This is shown in Pl. 255, Fig. 4.

(ii.) In the second type a delicate diaphragm stretches across the space enclosed by the ring, and through this the protoplasm is continuous, as through a sieve plate, by a number of delicate threads. This is perhaps the commonest form of continuity, and bears the closest possible resemblance to that met with in the sieve-tubes of higher plants. (Pl. 255, Fig 5.)

(iii.) The third type agrees with the second, except that continuity is effected by a thin and delicate ribbon of protoplasm, which passes through a narrow slit in the diaphragm. This form is not abundant, and appears to be an intermediate form between the preceding and the next to be described. (Pl. 255, Fig. 6.)

(iv.) In the fourth type the diaphragm is complete and impervious, save at the centre, where is an extremely minute pore, through which a single delicate strand of protoplasm maintains the continuity. (Pl. 255, Fig. 7.)

Besides the cases in which continuity is more or less evident, there are numerous others, in which the protoplasm still comes well up to the ends of the cells, and so obscures the nature of the connection between the contiguous protoplasts. This is worthy of note, as it shows the tenacity with which the protoplasm adheres to the end-plates, even after the roughest treatment, and though not demonstrative of continuity, is quite consistent with it and easily explicable by it.

A few cases, again, are met with, in which the ends are clear and the protoplasm has shrunk more or less in the longitudinal direction. In some of these there are clear evidences of a previously existing continuity in the fimbriated appearance of the ends of the protoplasmic mass.

With respect to the delicate diaphragm met with at the ends of the cells, the fact should be noted that it does not swell up under the action of reagents, nor does it stain like the rest of the walls. The same may be said of the annular thickening which encloses it. The various degrees of perforation exhibited by the diaphragm are doubtless indications of successive stages of development, the final term of which may be an imperforate diaphragm and a complete interruption of continuity. This, however, seems only to occur when the life of the cell comes to a close and a barrier is needed between the living and the dead parts of the tissue.

FUCUS.

Among the various forms of *Fucus* which have been submitted to examination, with a view to determining the presence or absence of continuity, the chief are *Fucus vesiculosus* and *F. serratus*.

The flattened, dichotomously-branched thallus of these plants has a minute structure, which very closely resembles that of *Ascophyllum nodosum*. In transverse and longitudinal sections, the epidermis, the cortex, and the central tissue, are readily distinguishable, and both in appearance and histological composition are extremely similar to the corresponding tissues of the plant named. The midrib, a feature not present in *Ascophyllum*, is formed by a greater development of the filamentous tissue of the central part of the frond.

As regards continuity the agreement is as close as in other respects. Under the influence of contracting reagents the protoplasm of the cells leaves the side walls, but it clings most tenaciously to the ends. By the employment of the methods already detailed, however, the tissues may be sufficiently swollen and clarified to allow the connection between contiguous cells to be definitely determined. When this is done, it is found that the cells of the central filaments have their protoplasts united, the union being effected either through open pores at the ends, or, indirectly, through the intervention of one of the sieve-plate arrangements described under *Ascophyllum*. Continuity is also maintained in the layers of cortical cells, as well as in the fibres, which arise from them and curve inwards to interlace with the central filaments. In a word, all that has been said respecting continuity in the previous paragraphs may be applied without error to the two species of *Fucus* now under consideration, and need not therefore be repeated.

Explanation of Plate 255.—*Ascophyllum nodosum.* Fig. 1. Longitudinal section through a portion of the thallus,—emidiagrammatic. 2. Portion of central tissue after treatment with sulphuric acid and ammonia. 3. Filament from central tissue, showing the protoplasm continuous through an open pore. 4. Ditto, showing the annular thickening in section. 5. Ditto, showing continuity by means of a sieve plate. 6. Ditto, by means of a slit. 7. Ditto, by means of a fine pore. 8. Fibres from the central tissue.

FERNS COLLECTED IN NORTH FORMOSA BY MR. WILLIAM HANCOCK.

By J. G. Baker, F.R.S.

The following is a list of the ferns contained in a collection which was made in 1881, by Mr. William Hancock, in the neighbourhood of Tamsui, at the northern extremity of the Island of Formosa. Mr. Oldham and Prof. Steere have previously made collections in the same district; but Mr. Hancock has both discovered several interesting new species and gathered several others not collected in the Island previously. The numbers are Mr. Hancock's collecting numbers, and those within brackets indicate the position of the novelties according to the sequence followed in 'Synopsis Filicum.'

61. *Gleichenia longissima* Blume.

75. *G. dichotoma* Hook.

62. *Alsophila ?*—Probably a new tree-fern, but not in fruit. In cutting and texture it closely resembles *Alsophila lunulata*. The rachis of the pinnæ is muricated throughout with raised points.

55. (48*). **Alsophila denticulata**, n. sp.—Stipe about a foot long, bright brown, clothed towards the base with abundant bright brown lanceolate paleæ. Frond moderately firm in texture, green on both surfaces, densely hairy on the ribs above, glabrous, but

clothed with copious minute ovate bullate scales on all the veins beneath, ovate-deltoid, $1\frac{1}{2}$ ft. long, tripinnatifid, but fertile also in a bipinnate form. Lower pinnæ of the tripinnatifid form the largest, distinctly petioled, lanceolate-deltoid, 4–5 in. long, $1\frac{1}{4}$–$1\frac{1}{2}$ in. broad. Lower pinnules distinct, sessile, lanceolate, pinnatifid, with oblong tertiary segments. Final segments oblong, 1–12th in. broad, conspicuously inciso-crenate; veining pinnate in the final segments; veinlets distinct, simple, erecto-patent. Sori brown, medial, superficial; receptacle but little elevated.

10. *Hymenophyllum Tunbridgense* Sm.

9. *H. polyanthos*, Sw.

7. *Trichomanes parvulum* Poir.

11. *T. radicans* Sw.

8. *T. Filicula* Bory.? No fruit and the segments more remote and less compound than in ordinary *Filicula*.

12. *T. javanicum* Blume.

79. *Dicksonia scabra* Wall. — Gathered lately by Dickins in Japan, but not known in China.

3. *Davallia pedata* Sm.

16 99. *D. strigosa* Sw.—Two forms.

63. *D. Griffithiana* Hook.

64. May be a new species near *D. fijiensis*, but not in fruit and therefore not safe to describe.

44. *Onychium japonicum* Kunze.

53. *Hypolepis tenuifolia* Bernh.

19. *Cheilanthes mysurensis* Wall.

6. *Lindsaya cultrata* Sw.

70 71. *L. flabellulata* Dryand.

5. *Adiantum Capillus-veneris* L.

36. *A. diaphanum* Blume.

35. *A. flabellulatum* L.

88. *Pteris ensiformis* Burm.

85. *P. semipinnata* L.

83. (16*). **Pteris** (EUPTERIS) **formosana**, n. sp.—Stipe yellow-brown, nearly naked, nearly a foot long. Frond ovate-deltoid, bipinnate, 12–15 in. long, moderately firm in texture, green on both surfaces, glabrous and without paleæ. Upper pinnæ simple, lanceolate; many lower subequal, oblong-lanceolate, 5–6 in. long, 2–$2\frac{1}{2}$ in. broad, cut away on the lower side at the base, with a long lanceolate entire tip and cut down nearly or quite to the rachis into 3–4 pairs of non-contiguous erecto-patent lanceolate pinnules $1\frac{1}{4}$–2 in. long, about $\frac{1}{4}$ in. broad, with an entire margin. Veining copiously pinnate; veins fine, erecto-patent, simple or forked. Fruit not seen. Allied to *P. semipinnata*, and the Japanese *P. inæqualis* Baker.

68. *P. quadriaurita* Retz.

56. *P. aquilina* L.

57. *P. incisa* Thunb.

98. *Lomaria adnata* Blume.

39 (35*). **Lomaria** (PLAGIOGYRIA) **concinna**, n. sp.—Caudex erect. Stipes tufted, greenish, nearly naked, those of the sterile

frond 4–5 in., of the fertile 8–10 in. long. Sterile frond oblong-lanceolate, simply pinnate, 8–9 in. long, 2½–3 in. broad, almost membranous in texture, green and glabrous on both surfaces. Pinnæ about 20 on a side, lanceolate, contiguous, adnate by a dilated base, ¼ in. broad, acute, minutely denticulate. Veins very distinct, rather ascending, simple or forked. Pinnæ of fertile frond fewer, remote, linear. Nearest the American *L. semicordata* Baker.

87. (14*). **Lomaria** (Eulomaria) **apodophylla,** n. sp. — Caudex erect. Basal scales dense, dark brown, large, linear, firm in texture. Fronds tufted, sessile, the sterile ones oblanceolate-oblong, rather thick in texture, 6–9 in. long, 1½–2 in. broad, simply pinnate, narrowed gradually to the base, green and glabrous on both surfaces. Pinnæ about 25 on a side, lanceolate, subobtuse, curving upwards, contiguous, adnate by a dilated base, entire, the central ones about an inch long, ⅙ in. broad. Veins quite hidden. Fertile pinnæ remote, linear, ascending, the central ones ¾–1 in. long, 1–12 in. broad. Indusium broad, firm, glabrous. Allied to *L. Spicant* and the Chilian *L. aspera* Klotzsch.

74. *Woodwardia radicans* Sm.
24. *Asplenium Nidus* L.
42. *A. normale* Don.
37. *A. resectum* Smith.

34. (106*). **Asplenium** (Euasplenium) **Hancockii,** n. sp. — Stipes densely tufted, 1½–3 in. long, greenish, clothed with minute linear-subulate ascending dark brown paleæ. Frond oblong-deltoid, subcoriaceous, 3–4 in. long, 1¼–1½ in. broad, tripinnatifid, green and glabrous on both surfaces; rachis slightly paleaceous. Lower pinnæ the largest, rhomboid, cut away cuneately on the lower side at the base ¼–⅓ in. broad, with few cuneate pinnules confluent at the base and strongly toothed on the outer edge. Veins distinct, very ascending. Sori linear, falling a little short of both midrib and margin. Indusium firm, persistent, glabrous. Allied to *A. laciniatum* and the small forms of *affine*.

88. *Asplenium davallioides* Hook.
78. *A. nigripes* Blume. var.
22. *A. lanceum* Thunb.
46. *A. bantamense* Baker.

34. (106*). **Asplenium** (Diplazium) **chlorophyllum,** n. sp. —Stipes tufted, dull grey-green, pubescent, as is also the rachis, ½ ft. long. Frond oblong-lanceolate, simply pinnate, a foot long, 4–5 in. broad, moderately firm in texture, green on both surfaces, minutely paleaceous over the lamina above, and densely clothed with minute linear-subulate scales on the veins beneath. Pinnæ about 20 on a side, close, lanceolate, sessile, acute, crenulate towards the tip, conspicuously auricled on the upper side at the base, the central ones 2–2½ in. long, ½–⅝ in. broad, the lowest strongly deflexed. Veins distinct, erercto-patent, deeply forked. Sori falling but little short of both midrib and margin, ¼–⅓ in. long, rarely diplagioid. Indusium crisped, narrow, moderately firm, pale brown, glabrous, persistent. Allied to *A. pallidum* Blume.

9. *Asplenium japonicum* Thunb.

67. *A. Wichuræ* Mett.—New to Formosa, but gathered by Shearer in Kew-kiang.

86. *A. esculentum* Presl.

84. *Aspidium deltodon* Baker.—Mr. Hancock's specimen quite agrees with the original type collected by Maries in Central China.

65. *A. aculeatum* Sw.

51. *A. amabile* Blume.

41. (29*). **Aspidium** (Polystichum) **reductum,** n. sp.—Stipes densely tufted, 3–5 in. long, greenish, slightly scaly. Frond lanceolate, simply pinnate from a deltoid bipinnate base, 5–6 in. long, moderately firm in texture, green and glabrous on both surfaces. Lower pinnæ one on each side, as in *A. tripteron*, $\frac{1}{2}$–1 in. long. Central pinnæ $\frac{3}{4}$–$\frac{7}{8}$ in. broad; segments subquadrate, attached by the lower corner, $\frac{1}{3}$ in. long, entire on the inner side and inner half of the lower, sharply dentate for the rest of the margin. Veins ascending, the central ones forked, the lowest on the upper side pinnate. Sori medial, in a single complete low and a very incomplete second one. Indusium peltate, membranous, glabrous. Very near *A. tripteron*, but on a much reduced scale.

14. *A. falcatum* Sw.

13. *Nephrodium gracilescens* Hook.

93. *N. decursivo-pinnatum* Baker.

54. *N. setigerum* Baker.

52. *N. Filix-mas* Rich., var.

17. (134*). **Nephrodium** (Lastrea) **leucostipes,** n. sp.—Stipes 9–12 in. long, slender, whitish, densely clothed throughout, as is the rachis, with spreading subulate dark brown paleæ. Frond deltoid, tripinnatifid, 12–15 in. long, moderately firm in texture, green and finely pubescent on the veins on both sides. Lower pinnæ much the largest, deltoid, more produced on the lower side. Pinules lanceolate, the lowest fully pinnate. Tertiary segments linear-oblong, entire, the largest $\frac{1}{6}$–$\frac{1}{4}$ in. long, 1-12th in. broad. Veining pinnate in the tertiary segments; veinlets distinct, simple, erecto-patent. Sori costal. Indusium membranous, minute, fugacious. Allied to *N. intermedium* Baker.

58, 59, 60. *N. molle* Desv.

90. *N. sophoroides* Desv.

94. *N. decurrens* Baker.

95. *N. variolosum* Baker.

43. *Nephrolepis ramosa* Moore.

73. *N. cordifolia* Presl.

80. *N. acuta* Presl.

4. *Polypodium* (*Phegopteris*) *distans* Don.—New to China.

50. (230*). **Polypodium** (Goniophlebium) **formosanum,** n. sp. —Rhizome wide-creeping, naked, glaucous, $\frac{1}{6}$ in. diam. Stipes distant, brownish, naked, about $\frac{1}{2}$ ft. long. Frond oblong-lanceolate, membranous, simply pinnate, 10–12 in. long, 3–4 in. broad, green on both sides, hairy on the main veins. Pinnæ 20–30 on a side, crowded, dilated and slightly confluent at the base, those of the barren frond obtuse or subacute, $\frac{1}{3}$ in. broad, the

lowest rather reduced and a little deflexed. Areolæ in two rows, only the inner row with an included free veinlet. Pinnæ of fertile frond narrower and more acute. Sori medial, uniserial, moderately large, superficial, 12–15 jugate. Allied to *P. amœnum* Wall. and *P. niponicum* Mett. The latter has been gathered in China both by Shearer and Maries.

32. *P.* (*Niphobolus*) *Lingua* Sw.

33. *P. polydactylon* Hance, Journ. Bot. 1884, 269.—A most distinct and interesting novelty.

69. *P.* (*Drynaria*) *conjugatum* Lam.

96. *P.* (*Phymatodes*) *linearifolium* Hook.

30. *P. lineare* Thunb.

25. *P. normale* var. *P. chinense*, Mett.

28. *P. normale* var. *sumatranum* Baker, in Journ. Bot. 1880, p. 215.—Only gathered before in Sumatra.

45. *P. hastatum* Thunb.

49. *P. Dipteris* Blume.

23. *P. pteropus* Blume.

31. (298*). **Polypodium** (Phymatodes) **macrosorum**, n. sp. —Rhizome wide-creeping, hypogæous, $\frac{1}{6}$–$\frac{1}{8}$ in. diam.; paleæ small, dense, spreading, lanceolate, brown-black. Sterile frond lanceolate, simple, coriaceous, glabrous, 4–8 in. long, nearly an inch broad at the middle, narrowed gradually to both ends, its naked stipe 3–4 in. long. Veins fine, immersed, indistinct. Fertile frond usually much smaller. Sori very large ($\frac{1}{8}$ in. diam.), globose, superficial, uniserial, 4–10 on each side of the midrib, confined to the upper half or two-thirds of the frond. Allied to *P. accedens* Blume.

100. (360*). **P.** (Phymatodes) **Hancockii**, n. sp. — Rhizome short-creeping. Paleæ small, black, membranous, lanceolate, clathrate. Stipes none, a narrow wing reaching down to the very base of the rachis. Frond oblanceolate, simple or slightly compound in the upper third, $\frac{1}{2}$–1 ft. long, with 2–3-jugate lanceolate pinnæ an inch broad; wing to the rachis $\frac{1}{2}$ in. broad halfway up the frond either in the simple or compound form, narrowed to the base very gradually; texture thin, but moderately firm; both surfaces green and glabrous. Main veins indistinct. Areolæ copious, hexagonal, with abundant included free veinlets. Sori small, copious, superficial, scattered irregularly. Cutting of the less-divided forms of *P. Phymatodes*. Sori more like those of *P. affine* Blume.

21. *Gymnogramme Wrightii* Hook.

82. *G. elliptica* Baker.

20. *G. lanceolata* Hook.

47. *G. Maingayi* Baker.—New to the Chinese area. Known before only at Malacca and Penang.

2. *Antrophyum plantagineum* Kaulf.

26, 27. *Vittaria elongata* Sw.

77. *Meniscium triphyllum* Sw.

20. *Drymoglossum carnosum* var. *obovatum* Harringt.—Gathered previously only at the same place by Steere.

40. *Hemionitis Griffithii* Hk. fil. & Thoms.
1. *Acrostichum sorbifolium* L.
15. *A. repandum* Blume.
48. *A. aureum* L.
76. *A. bicuspe* Hook, var. *integrifolium* Eaton.
89. *Osmunda javanica* Blume.
72. *Lygodium japonicum* Sw.
81. *Angiopteris evecta* Hoffm.

A CONTRIBUTION TOWARDS A FLORA OF BRECONSHIRE.

By W. Bowles Barrett, F.L.S.

(Continued from p. 89).

Lapsana communis L. Very common.

Hypochæris radicata L. C.

Leontodon hirtus L., *L. hispidus* L., and *L. autumnalis* L. C. No *Picris hieracioides* or *Helminthia echioides* seen.

**Tragopogon pratensis* L. Canal bank, Talybont. Seemingly uncommon in South-east and Mid-Wales.

Taraxacum officinale Wigg. Near Newbridge; *A. Ley.* — Var. c. *lævigatum.* Dry limestone rocks, Craig-y-Rhiwarth, Pen-y-wyllt; *A. Ley.*

Lactuca muralis Fresen. Remarkably common and generally distributed. — *L. virosa* L. Not seen.

Sonchus oleraceus L. F. Gilwern, Three Cocks Junction, &c. — *S. asper* Hoffm. Near Newbridge; *A. Ley.* — *S. arvensis* L. F. *A. Ley.*

Crepis virens L. Nantgwyllt; *A. Ley.* Crug Lane, near Brecon; *Mrs. Fryer.* — Var.* *agrestis* W. & K. Gilwern.

Hieracium Pilosella L. C. — *H. pallidum* Fr.? Limestone rocks, Craig-y-Rhiwarth, Pen-y-wyllt; *A. Ley;* (doubtful whether *pallidum* or *cæsium;* most likely a *cæsium* form; *J. G. B.*) — *H. murorum* L., pt. F. on the Tarens in the Honddu Valley, a large form; *A. Ley.* F. Gilwern. Brecon. Ravine Ffrwdgrech Waterfall. — *H.* (*cæsium* Fr., I think; *J. G. B.*). Craig-y-gledsiau, Brecon Beacons; *A. Ley.* — *H. vulgatum* Fr. F. On the Tarens in the Honddu Valley; by the Usk, above Brecon; *A. Ley.* Rhymney Bridge Vale. Gilwern. — *H.* '*gothicum* Fr.'? Stream side, Cwm Tarell; Brecon Beacons; *A. Ley;* (most likely a var. of *vulgatum*, receding from type towards *tridentatum; J. G. B.*). — **H. tridentatum* Fr. *teste* J. G. Baker. Rocks in vale above Rhymney Bridge Station. — *H. prenanthoides* Vill. Mountain cliff at Taren r' Esgob near Llanthony, in plenty, though on a very restricted spot, about a rill of strongly petrifying water, alt. 1000 feet: affirmative answer to query in Top. Bot.; *A. Ley.* —*H. umbellatum* L. Pen-y-wyllt. Near Dolygaer reservoir. — *H.*

boreale Fr. Near Nantgwyllt; *A. Ley.* F. Widely distributed and characteristic: noted at Gilwern, Dolygaer, Talybont, Hay.

Jasione montana L. Abundant near Rhayader; *A. Ley.* Priory Groves, Brecon; *Mrs. Fryer.* Sparsely distributed. Heathy ground above Rhymney Bridge Station. Torpantau.

**Campanula latifolia* L. F. on banks of the Usk above Brecon; *A. Ley.* — *C. rotundifolia* L. C. No other *Campanula* seen by me. — *C. patula* L. Gibson, MS., Top. Bot. ed. ii. Llyswen and towards Boughrood, abundant along the roadsides, 1884; *H. N. Ridley.*

Wahlenbergia hederacea Reich. Lower part of Elan Valley; *A. Ley.* Rare. Bog above Rhymney Bridge Station, sparingly. Not seen elsewhere by Rev. A. Ley or myself.

Vaccinium Oxycoccus L. Top. Bot. ed. ii. Not seen by Rev. A. Ley or myself. Mr. Ley believes it to be quite absent from the Black Mountain district. — *V. Vitis-idæa* L., "F. A. Lees, sp.," Top. Bot. ed. ii. Rather C. on the Black Mountain; *A. Ley.* — *V. Myrtillus* L. Abundant.

Erica Tetralix L. F. Generally in small quantity, and I think not C., except on the hills of the Black Mountain district, where, according to Mr. Ley, no other *Erica* is found. — *E. cinerea* L. Very common.

Calluna vulgaris Salisb. Very abundant on the hills of the Black Mountain district; *A. Ley.* Shewing local tendencies.

Fraxinus excelsior L. F.

Ligustrum vulgare L. Not seen. It has not yet been recorded for Radnor.

Vinca major L. Near a house; not wild; *A. Ley.*

Erythræa Centaurium Pers. Near Erwood; *A. Ley.* Not uncommon. Talybont. Llangorse. Near Brecon. Hay. No *Gentiana* seen.

Menyanthes trifoliata L. Very rare in the Black Mountain District; boggy meadows, Capel Coelbren; Blaen-Taf-vechan?; *A. Ley.* Rare. Llangorse Lake. Appears to be very sparingly distributed in South-east and Mid-Wales.

**Convolvulus arvensis* L. I saw this once, but did not note the locality, which was probably Gilwern. The plant is, I think, quite rare; it has not yet been reported from Radnor. — *C. sepium* L. C.

Solanum Dulcamara L. Near Three Cocks Junction; *A. Ley.* Uncommon. Pen-y-wyllt. Gilwern. Only yet reported from one locality in Radnor.

Verbascum. It is noteworthy that no species of *Verbascum* has yet been recorded, either from Brecon or Radnor.

Scrophularia Balbisii Horn. C. — *S. nodosa* L. Pen-y-wyllt; *A. Ley.*

Digitalis purpurea L. Very common.

**Linaria Cymbalaria* Mill. F. Introduced. — *L. vulgaris* Mill. Llyswen, very abundant; *H. N. Ridley.* Talyllyn. Brecon. Hay. *L. minor* Desf. Railway near Talyllyn Junction, plentiful. Among vetches, Talyllyn. Three Cocks Junction.

**Mimulus luteus* L. Thoroughly established in river-bed above Rhymney Bridge Station.

Veronica polita Fries. F. — *V. agrestis* L., *V. arvensis* L., and *V. serpyllifolia* L. F.—*V. Buxbaumii* Ten. Cultivated land, Three Cocks Junction; *A. Ley*, 1883. Not seen by me in the county. — *V. officinalis* L. Nant-gwyllt; *A. Ley*. Not uncommon. Gilwern. Brecon. Alltmawr. Builth. — *V. Chamædrys* L. C. — *V. montana* L. Priory Groves, Brecon; *Miss Fryer*. Rare. Wood, Gilwern.—*V. scutellata* L., var. *pubescens* Koch (*V. parmularia* Poit.). Cwm Tarell; *A. Ley*. — *V. Anagallis* L. Scarce. Banks of Usk, Talybont. Llangorse Lake, abundant. — *V. Beccabunga* L. C.

Euphrasia officinalis L. Very common.

Bartsia Odontites Huds., vars. a *verna* and b. *serotina*. Generally distributed.

Pedicularis palustris L. Boggy meadows, Capel Coelbren; *A. Ley*. Local. Pen-y-wyllt. Builth. — *P. sylvatica* L. Nantgywllt; *A. Ley*. Vennyfach Rocks; *Miss Fryer* Local. Near Rhymney Bridge Station. Torpantau.

Rhinanthus Crista-Galli L. C.

Melampyrum pratense L. Nant-gwyllt; *A. Ley*. Apparently uncommon in South Breconshire; frequent elsewhere. Pen-y-wyllt. Abundant above Ffrwdgrech Waterfall, near Brecon. Copse Garth, sparingly.—Var. *montanum*. Coed-fenni, near Brecon; *A. Ley*.

Orobanche Hederæ Duby. Top. Bot. ed. ii. — *O. minor* L. Top. Bot. ed. ii. No *Orobanche* seen by Rev. A. Ley or myself.

**Verbena officinalis* L. Three Cocks Junction; *H. N. Ridley*. Gilwern. Llangorse. Hay.

**Lycopus europæus* L. Canal, Gilwern. Llangorse Lake. Hay.

Mentha sylvestris L. Top. Bot. ed. ii. Riverside, near Three Cocks Junction; *A. Ley*. Betwen the Usk and the Canal, Brecon; *Miss Fryer*. Llangorse village, probably introduced. — *M. Piperita* Huds. Near a house, Penderyn; *A. Ley*. Llangorse village, probably introduced. — **M. hirsuta* L. C. *M. sativa* L. Top. Bot. ed. ii. — Var.* b. *paludosa*. Talybont. — **M. arvensis* L. C. Widely distributed.

Thymus Serpyllum Fries. F. on mountains, &c.; less C. than in most districts.

Origanum vulgare L. Newton Pool, near Brecon; *Miss Fryer*. Rare. Wooded bank of the Wye above Hay Church, sparingly.

Calamintha Clinopodium Spenn. F. and widely distributed. *C. Acinos* Clairv. Not seen. — *C. menthifolia* Host. C; *Mrs. Farquharson*, Top. Bot. ed. ii. By the Usk, above Brecon; *A. Ley*. Rare; not seen by me.

**Nepeta Glechoma* Benth. C.

Prunella vulgaris L. C.

**Scutellaria galericulata* L. Llangorse Lake, east side; *H. N. Ridley*. Not seen anywhere by me. — *S. minor* L. Recorded Top. Bot. ed. ii.; not seen.

Ballota nigra L. The absence or rarity of this plant in Brecon and Radnor is remarkable.

Stachys Betonica. L Lower Elan Valley; *A Ley.* Brecon; *Miss Fryer.* F. Rhymney Bridge Vale. Gilwern. Garth. Builth. — **S. palustris* L. C. — *S. ambigua* Sm. Llangorse village. — *S. sylvatica* L. C. —**S. arvensis* L. Scarce. Llangorse.

Galeopsis versicolor Curt. Llanwrthwl; *A. Ley.* — *G. Tetrahit* L. Cultivated ground. F. Widely distributed. No other *Galeopsis* seen by me.

**Lamium purpureum* L. C. No other *Lamium* seen by me. — *L. album* L. Near Brecon; *Miss Fryer.* Scarce. — *L. Galeobdolon* Crantz. Top. Bot. ed. ii.: Priory Groves, Brecon; *Miss Fryer.* Not seen by Rev. A. Ley or myself.

Ajuga reptans L. Near Brecon; *Miss Fryer.*

Teucrium Scorodonia L. Nant-gwyllt; *A. Ley.* F. Gilwern. Brecon. Builth.

No *Echium*, *Lithospermum*, or *Cynoglossum* seen.

Myosotis cæspitosa Schultz. Pen-y-wyllt; *A. Ley.* The most frequent water *Myosotis;* noted near Rhymney Bridge Station, Gilwern, Talybont, Llangorse. — *M. palustris* With. Near Builth; *A. Ley.* Brecon. Hay. — *M. repens* Don. Cwm Tarell; *A. Ley.* Dolygaer. Epynt Hills, near Garth (about 2000 feet). — *M. arvensis* Hoffm. C. — *M. versicolor* Reich. Nant-gwyllt; *A. Ley.*

**Anchusa arvensis* Bieb. Dry bed of Usk, Talybont. Rare in Mid-Wales.

Symphytum officinale L. Meadow near Newbridge; *A. Ley.* Not seen by me: the rarity of this plant in Brecon and Radnor is noteworthy.

Pinguicula vulgaris L. Cwm Tarell; *A. Ley.* C. Pen-y-wyllt. Dolygaer. Torpantau. Epynt Hills, near Garth.

**Primula vulgaris* Huds. Very C. — *P. officinalis* L. Abundant and fine at Pen-y-wyllt; *A. Ley.* Fields around Brecon; *Miss Fryer.* Scarce generally, only once seen by me, in ravine above Torpantau Station.

Lysimachia vulgaris L. Near Erwood, *A. Ley.* Rare. Border of Llangorse Lake, east side. — *L. Nummularia* L. Erwood; *A. Ley.* Gilwern. Llangorse. — *L. nemorum* L. Lower Elan Valley; *A. Ley.* F. Rhymney Bridge Vale. Woods Gilwern. Llanthetty. Near Brecon. Near Builth.

Anagallis tenella L. Near Penderyn; *A. Ley.* F. in bogs. Pen-y-wyllt. Rhymney Bridge Vale. Dolygaer. Mountain bog, Torpantau. — *A. arvensis* L. Newbridge; *A. Ley.* Near Llangorse Lake; *Miss Fryer.* Not seen by me; rare.

Plantago major L., and *P. lanceolata* L. C. — *P. media* L. Not seen.

Chenopodium album L., var. *a. *candicans.* C. — Var. *b. *viride.* Talybont. — Var. c. *paganum.* C. — **C. rubrum* L. Observed one vigorous plant only, on east side of Llangorse Lake. A very rare plant in inland Wales. — **C. Bonus-Henricus* L. Generally distributed about villages; doubtless introduced. Still cultivated as a pot-herb in South Wales. No *Chenopodium* seen, except the above.

Atriplex angustifolia Sm. C. Widely distributed. —**A. serrata*

Syme. F. in cultivated ground. Doubtless common throughout Wales, but, as yet, only recorded from two other Welsh counties. —**A. deltoidea* Bab. Very rare; carefully searched for, but only four or five plants seen together, near Llangorse Lake. Recorded from no other inland county, and from only two maritime counties in Wales.—**A. Smithii* Syme. Remarkably rare. One large plant on rock in Usk, between Brecon and Dinas.

Rumex conglomeratus Murr. C. — *R. nemorosus* Schrad. Elan Valley; *A. Ley.*—Var. *a. *viridis.* C. —*R. maritimus* L. Very rare. Observed one plant only on east side of Llangorse Lake. A single plant had been previously found by this lake by Rev. A. Ley. I am not aware of any other record for Wales.—*R. obtusifolius* Auct., *R. crispus* L., and *R. Acetosa* L. C. — *R. Acetosella* L. Rock at summit of Brecon Beacons, 2860 ft.; *A. Ley.* C.

Polygonum Convolvulus L. Nant-gwyllt; *A. Ley.* Pen-y-wyllt, Talybont. Builth. — *P. aviculare* L. C. Several forms. — *P. Hydropiper* L. C. Widely distributed.—*P. Persicaria* L. Very C. — *P. lapathifolium* L. Nant-gwyllt; *A. Ley.* Rare. Shores of Llangorse Lake, very sparingly. The rarity of this plant is noteworthy. — **P. maculatum* Trim. & Dyer. Shores of Llangorse Lake. There is but one other record for Wales. — *P. amphibium* L.* (the type). Canal, Talybont. River Lynvi. Llangorse. — Var. b. *terrestre.* Erwood; *A. Ley.* Llanthetty, near Talybont. Llangorse.

Empetrum nigrum L. Blaen Taf-vechan; *A. Ley.*

Euphorbia Helioscopia L. Near Llanwrthwl; *A. Ley.* Near Builth. *E. Peplus* L. C. — *E. exigua* L. Partricio; *A. Ley.* Not C. Llangorse. Near Brecon.—*E. amygdaloides* L. Not seen.

Mercurialis perennis L. Remarkably abundant throughout the county.

Parietaria diffusa Koch. Scarce. Old walls, Brecon; plentiful.

Urtica dioica L. F.—**U. urens* L. Apparently rather scarce, and only seen near houses. Brynmawr. Llangorse. Builth.

Humulus Lupulus L. Near Pen-y-wyllt; *A. Ley.* Gilwern. Talybont. Doubtless introduced.

Ulmus suberosa Ehrh. Hedgerow, Glyn Neath; probably planted; *A. Ley.* — *U. montana* Sm. F. — Var. c. *nitida.* Near Builth; planted; *A. Ley.*

Quercus sessiliflora L. Old natural woods, hillside, Nant-gwyllt; *A. Ley.*

Corylus Avellana L. Very common.

Alnus glutinosa L. *A. Ley.*

Betula alba L. C.—Var. b. *glutinosa.* Near Pen-y-wyllt; *A. Ley.*

Myrica Gale L., and *Juniperus.* None seen.

Salix fragilis L. *A. Ley.*— *S. Smithiana* Willd. Near Brecon; *A. Ley.*—*S. cinerea* L. Elan Valley. Pen-pont; *A. Ley.*—*S. aurita* L. Cwm Tarell; *A. Ley.* — *S. caprea* L. Nant-gwyllt; *A. Ley.* — *S. repens* L. Near Capel Coelbren; *A. Ley.* — *S. herbacea* L. On summit of northern precipice of Brecon Beacons, fine and in some plenty, 1883; *A. Ley.*

**Taxus baccata* L. F., especially in South and Mid Breconshire;

in some cases possibly native. The yew is now being extensively destroyed in the county, owing to the belief that its leaves are fatal to horses feeding on them.

**Typha latifolia* L. Apparently rare. Talyllyn. — **T. angustifolia* L. Llangorse Lake, in some plenty. The only record from an inland Welsh county.

**Sparganium ramosum* Huds. Uncommon. Talybont. Brecon. — *S. simplex* Huds. Llangorse Lake. Swamp near the Usk, east of Brecon.

**Arum maculatum* L. F.

**Lemna minor* L. C.

Potamogeton natans* L. Apparently scarce. Llangorse Lake.— *P. polygonifolius* Pourr. Junction of Rivers Wye and Elan; *A. Ley.* Only seen near Aberbran, and in bogs, Epynt Hills.—P. perfoliatus* L. Wye near Builth Wells. — **P. crispus* L. Canal, Talybont. Brecon. Wye at Hay. — *P. densus* L., searched for unsuccessfully. Appears to be scarce in Wales; the Rev. A. Ley informs me that it is very scarce in Herefordshire. — *P. pusillus* L., *teste Arthur Bennett.* In a brook near Hirwain, dividing the counties of Brecon and Glamorgan; *A. Ley.*

**Ruppia rostellata* Koch. Canal about 1½ miles south of Talybont, in some plenty. The occurrence of this maritime plant, at a distance of about 35 miles (by canal) from the sea, is remarkable.

**Triglochin palustre* L. F. in swamps. Pen-y-wyllt. Mountain above Torpantau Station, about 1700 ft. Canal, Talybont. Llangorse Lake.

**Alisma Plantago* L. Canal, Gilwern. Llangorse Lake. — Var. *b. *lanceolatum* With. Llangorse Lake, but less frequent than the type.

**Butomus umbellatus* L. Llangorse Lake, east side; *H. N. Ridley.*

**Elodea canadensis* Mich. Canal at Gilwern and Talybont. Llangorse.

**Orchis mascula* L. Hay road, Brecon. Vennyfach; *Miss Fryer.* — *O. incarnata* L. Meadow near Gludy Lake; a slender form, *teste A. Bennett*; *Miss Fryer.* — *O. maculata* L. Cwm Tarell; *A. Ley.* Near Brecon; *Miss Fryer.* F. Near Dolygaer. Torpantau. Near Llangorse Lake. Near Garth.

**Gymnadenia conopsea* Br. F. in the Black Mountain District; *A. Ley.*

Habenaria viridis Br. Top. Bot. ed. ii. Not seen by Rev. A. Ley or myself. — *H. bifolia* Bab. Man. Grwyne-faur Valley; *A. Ley.* *Ophrys* and *Spiranthes* not seen.

Listera ovata Br. Rough meadows by the Usk, Brecon; *A. Ley.* Apparently scarce. Not seen by me.

**Neottia Nidus-avis* L. Near Pont-nedd-vechan, on the way to Llynvach. *Sowerby in Herb. Brit. Mus.* Is just inside the county borders, I believe; *H. N. Ridley.*

(To be continued.)

NOTES ON CERTAIN *PASSIFLOREÆ* FROM WESTERN TROPICAL AMERICA.

By Maxwell T. Masters, M.D., F.R.S.

The following notes refer to a small collection of *Passifloreæ* made by Mr. Lehmann when travelling in various parts of Central America and New Granada. They comprise the description of two previously undescribed forms, and they may serve to extend our knowledge of certain species and their distribution. In drawing up the list I have availed myself of the careful notes made by Mr. Lehmann. Throughout I have cited my monograph of the order in Martius and Eichler's 'Flora Brasiliensis,' vol. xiii., part 1, March, 1872, in which full synonymy and references to the literature will be found. I have also quoted, where necessary, the monograph of New Granadan species by Messrs. Triana and Planchon in the 'Annales des Sciences Naturelles,' 5me ser., t. xvii. (1873), p. 121; and my own paper relating to the species collected by M. André in the 'Journal of the Linnean Society,' vol. xx., p. 25 (1882).

Tacsonia *Juss.*

T. pinnatistipula Juss.; Mast. in Flor. Brasil. *l. c.* 537; Journ. Linn. Soc. xx. p. 26. -- "Grows in the western mountains of the Savana de Bogota, alt. 2500 metres. State of Cundinamarca, fl. January, of a most beautiful rose-colour."—*Lehmann* n. 2509.

T. mixta Juss.; Mast. in Flor. Brasil. *l. c.*—Var. *quitensis* Mast. *l. c.* 541; et in Journ. Linn. Soc. xx. p. 28.—"Curubo or Curubita incol. Bogotens. Stems much branched, attaining a length of 8 metres. Leaves of robust texture, pubescent, opaque, dark green. Flowers light flesh-red. Fruit elliptic, as large as a partridge-egg, eatable. Grows on fences about Fontibon, on the Savana de Bogotá, alt. 2500–2800 metres, January, 1883. State of Cundina marca."—*Lehmann* n. 2489. Triana and Planchon, p. 132, prefer to place this under *P. tomentosa* of Lamarck.

T. mixta Juss.—Var. *speciosa* Mast. *l. c.* 541.—*P. mixta* Triana et Planchon *l. c.* 128.—"Flowers light flesh-red. Open woods near Paisbamba, on the western slopes of the volcano of Sotará, alt. 2800 metres, May, 1883. State of Cauca, Colombia."—*Lehmann* n. 2480.

In a former communication I have alluded to the different arrangement of certain forms of *Tacsonia*, and to the different views as to the synonymy of the species taken by Messrs. Triana and Planchon from those I have adopted. The species, so-called, probably intercross freely, and the fruit is rarely preserved in herbaria, so that there is ample room for difference of opinion. Messrs. Triana and Planchon speak of the fruits of *P. tomentosa*, under which they include *T. quitensis* and *T. mollissima*, as "deux fois gros comme un œuf de poule," yellow, velvety, with a pulpy aril to the seed, of a yellow colour, a pleasant odour, and agreeable taste. The fruit of *T. mollissima* in English gardens answers fairly to this description, but is more elongated and ellipsoidal in form. The fruits of *P. mixta*, according to Messrs. Triana and Planchon, are smaller, glabrous, always of a green colour, with a brittle pericarp, and with less fragrant and agreeable pulp. Mr. Lehmann's observation has been already cited, and it serves to show—of which, indeed, there is other evidence—that the vernacular names, Curuba, &c., are applied to different forms.

Under No. 2624 Lehmann collected a remarkable specimen, the flowers of which were in a monstrous condition. As the specimen seems to combine in some degree the characters of the foliage of *T. mollissima* with the floral structure of *T. pinnatistipula*, especially the faucial corona, which consists of numerous long threads, I am disposed to think the specimen in question to be of hybrid origin. The stamens originated from a fleshy longitudinally ribbed cup emerging from above the centre of the gynophore, and were prolonged into long stalks terminating in flat petaloid dilatations of a spear-head shape and representing the anthers. The conformation of the ovary was normal. Mr. Lehmann says of this specimen:—"Curubita, in col. Bogotens. . . . . . . Flowers lilac-red. Grows in open woods on the Savana de Bogotá, Jan. 1883. State of Cundinamarca, Colombia."

PASSIFLORA *Linn.*

P. SUBEROSA Linn.; Mast. *l. c.* 578; et in Journ. Linn. Soc. xx. p. 34; Triana et Planchon *l. c.* 157.—Isthmus of Panama, *Lehmann* 1849.

P. SEXFLORA Juss.; Mast. *l. c.* 548.—"Grows in open places in damp luxuriant woods in the Baja-Verapaz Mountains, near Purulá, 1500 metres, April, 1882. Guatemala."—*Lehmann* 1419. Not previously recorded from Guatemala.

P. lancearia (§ DECALOBA) Mast., sp. n.

Glabra, ramis teretibus striatis; foliis 8 cm. long. 4 cm. lat. membranaceis ovato-oblongis basi apiceque angustatis margine supra medium utrinque obscure lobulatis, trinerviis, basi inter nervos glanduloso-ocellatis; petiolis 10–15 mm. eglandulosis; stipulis parvis lineari-subulatis deciduis; pedunculis geminis 1-floris petiolos subæquantibus; bracteis minutissimis dissitis; floribus diametro 3 cm. tubo late expanso vix umbilicato; sepalis oblongis obtusis aurantiacis; petalis paulo brevioribus albidis; corona fauciali e filis petaloideis 1-serialibus falcato-spatulatis petalis parum brevioribus constante; corona media membranacea breve-tubulata plicata inflexa margine dentata; corona basilari annulari basin gynandrophori gracilis cingente; ovario ellipsoideo glabro supra staminum insertionem longiuscule stipitato.

In montem ignivomem Tranzu Costa Rica ad alt. 1500–1600 met. legit *Lehmann* 1255!

A distinct-looking species, growing, according to Lehmann, in light but very damp woods near La Palma and San Isédro, on the slopes of the volcano of Tranzú, at an elevation of 1500–1600 metres. "The stem is much branched, reaching a length of 8 metres. Leaves

of good texture, pale green; flowers white" (orange-coloured when dry—M. T. M.). The foliage is like that of *P. mollis* var. *subintegra*, but the flowers are quite different.

P. Lehmanni (§ Decaloba) Mast., sp. n.

Glabra, ramis gracilibus subangulatis striatis; foliis distantibus ad 10 cm. long. 13 cm. lat. subcoriaceis cordatis profunde trisectis, segmentis anguste lanceolatis basi ad margines glandulis majusculis instructis, segmento medio vix longiore, petiolis 3 cm. long, gracilibus glandulis paucis dissitis remotis præditis; stipulis 3 cm. long. foliaceis oblique reniformibus mucronulatis; pedunculis 10 cm. long. gracilibus; bracteis parvis foliaceis dissitis munitis; floribus diametro 3 cm.; tubo brevi late cupulari basi umbilicato; sepalis lineari-oblongis obtusis dorso sub apice vix corniculatis; petalis sepalis subæquilongis conformibus albidis; corona fauciali filamentosa filis externis albidis lineari-clavatis petalis subæquantibus, filis interioribus multo brevioribus numerosissimis capitatellis, corona media membranacea inflexa subulata apice lacero-lobulato; corona infra mediana annulari crassiuscula integra; corona basilari gynandrophori basin cingente cupulari crenulata; ovario ellipsoideo glabro, stylis teretibus stigmatibus reniformibus.

Prope Viotam, Nov. Granat. legit cl. *André* 1713 (folia tantum)!; in prov. Cundinamarca prope Fusagasugá alt. 2000 met. *Lehmann* 2524!

A distinct and remarkable species, of which André collected the leaves only (Journ. Linn. Soc. xx. p. 43). Lehmann, however, met with flowering specimens in the locality above-mentioned, which allow of a more complete description being drawn up. The last-named collector speaks of it as attaining a length of 5 metres, "leaves opaque sap-green, of good texture; flowers greenish-white. Grows in very luxuriantly-developed woods in openings near Fusagasugá."

P. alnifolia H., B. et K.; Mast. *l. c.* p. 549 (excl. syn. *P. bogotensis*); Journ. Linn. Soc. xx. p. 35; Triana et Planchon *l. c.* p. 164. — Grows in open woods near Juntas, on the banks of the Rio Dagua, 300–800 metres. March. State of Cauca, Colombia. —*Lehmann* 2758.

P. bogotensis Bentham; Triana et Planchon *l. c.* p. 163; Mast. in Journ. Linn. Soc. xx. p. 36. — "Grows in open localities near the Salto de Tequendama, 2400 metres. February. State of Cundinamarca."—*Lehmann* 2538.

P. mollis H. B. et K.—Var. *subintègra* Triana et Planchon *l. c.* p. 164; Mast. in Flor. Brasil. *l. c.* p. 550.—"Flowers white, sweet-scented. Fruits globose, the size of a gooseberry, dark blue. Grows in wood-openings near Fusagasugá, 2200 metres. February. State of Cundinamarca, Colombia."—*Lehmann* 2525.

P. lunata Willd.; Mast. *l. c.* p. 552; et in Journ. Linn. Soc. xx. p. 38. — "Grows in woods in the Rancha Mountains, between Tactic and San Juan de Chamelco, 1800 metres. May. Guatemala." —*Lehmann* 1422.

P. (subgen. *Murucuia*) bicuspidata Mast. *l. c.* p. 558; Triana et

Planchon *l. c.* 179. — "Leaves pale glaucous green. Flowers copper-red. Grows in dense mountain-woods between Sibaté and Fusagasugá, 2600–3000 metres. February. State of Cundinamarca, Colombia."—*Lehmann* 2498.

P. (subgen. *Granadilla*) LIGULARIS Juss.; Mast. *l. c.* p. 559; et in Journ. Linn. Soc. xx. p. 40; Triana et Planchon *l. c.* p. 150. —"*Granadilla* in col. Flowers greenish white, filaments light violet-blue. Fruit as large as a goose's egg, edible. Woods about Pasca, 2600 metres. February. State of Cundinamarca, Colombia." —*Lehmann* 2518.

P. VITIFOLIA H. B. et K.; Mast. *l. c.* p, 607; et in Journ. Linn. Soc. xx. p. 41; Triana et Planchon *l. c.* p. 143.—"Flowers glowing blood-red, often produced on the old wood near the base. Damp woods on the north-east slope of the volcano of Turrialba, 0–600 metres. February. Costa Rica."—*Lehmann* 1268.

P. PULCHELLA H. B. et K.; Mast. *l. c.* p. 570; Triana et Planchon *l. c.* 167.—"Leaves pale glaucous green. Flowers light violet. Grows in thorny bushes about Punta Arenas. July. Costa Rica."—*Lehmann* 1735.

A SYNOPSIS OF THE GENUS *SELAGINELLA*.

By J. G. Baker, F.R.S., &c.

(Continued from p. 48.)

233. S. LÆVIGATA Baker in Gard. Chron. 1867, 1190. — *S. pectinata* Spring. — *Lycopodium lævigatum* Lam. — *L. pectinatum* Willd.—Stems erect, 1–1½ ft. long, simple in lower half, the leaves small, distant and soon deciduous, deltoid in the upper half, with petioled deltoid 1–2-pinnate pinnæ, the erecto-patent final divisions reaching 2–3 in. long, ¼–⅓ in. broad. Leaves of the lower plane crowded, oblong-lanceolate, subpatent, very falcate, acute, ⅛–⅙ in. long, bright green, firm in texture, adnate by a broad base, decurrent on the lower side, cuneate on the upper, not imbricated over the stem; leaves of the upper plane minute, lanceolate, recurved, acute. Spikes square, ½–1 in. long, ½–1 lin. diam.; bracts ovate, acute, strongly keeled.

Var. *S. Lyallii* Spring Mon. ii. 168. — More compound; lower pinnæ bipinnate, with final divisions ½–1 in. long, ⅛–⅙ in. broad.

Hab. Madagascar. The two varieties are connected by gradual intermediates.

234. **S. microdendron**, n. sp. — Stems erect, a span long, simple in the lower third or quarter, with the leaves adpressed, stramineous, compound upwards, the pinnæ erecto-patent, lanceolate or deltoid, 1–2-pinnate, the ultimate segments erecto-patent, not contiguous, ¼–½ in, long, 1 lin. broad. Leaves of the lower plane crowded, erecto-patent, ovate, acute, ½ lin. long, bright green, rigid, dilated on the upper side at the base, broadly rounded,

shortly ciliated, and much imbricated over the stem; leaves of the upper plane minute, oblique ovate, with a short cusp. Spikes short, square, $\frac{1}{2}$ lin. diam.; bracts ovate-cuspidate, acutely keeled.

Hab. Cuba, *Wright* 3910! A near ally of *S. caulescens.*

235. S. PULCHERRIMA Liebm. — Stems above a foot long, stramineous, erect, simple, with adpressed leaves in the lower two-thirds, deltoid and decompound in the upper third, with 3–4-pinnate close deltoid pinnæ, with ascending contiguous ultimate segments $\frac{1}{2}$–1$\frac{1}{2}$ in. long, 1 lin. broad. Leaves of the lower plane crowded, ascending, ovate, falcate, acute, bright green, rigid, $\frac{1}{2}$ lin. long, not ciliated, dilated, broadly rounded, and imbricated over the stem on the upper side at the base; leaves of the upper plane minute, oblique ovate, cuspidate, incurved. Spikes square, $\frac{1}{4}$–$\frac{1}{2}$ in. long, $\frac{1}{2}$ lin. diam.; bracts ovate-cuspidate, strongly keeled.

Hab. Hacienda de Java, Mexico, *Liebmann*! Midway between *caulescens* and *flabellata.*

236. S. COARCTATA Spring Mon. ii. 164. — Stems stiffly erect, stramineous, about a foot long, simple and nearly leafless in the lower part, compound and pubescent upwards; pinnæ petioled, ascending, conduplicate; pinnules subflabellately compound. Leaves of the lower plane very crowded, ascending, falcate, ovate, acute, $\frac{1}{2}$ lin. long, rigid, minutely serrulate, with an obscure midrib and revolute edges; leaves of the upper plane scarcely smaller, very crowded, ovate, mucronate. Spikes very short; bracts ovate-lanceolate, squarrose.

Hab. On the Rio Negro, at Mount Aracoara, *Martius.* Easily marked in the group by the leaves of both planes being nearly uniform in shape and size.

237. **S. rionegrensis,** n. sp. — Stems about a foot long, stramineous, stiffly erect, unbranched in the lower half, the upper leaves of this part slightly spreading, deltoid and decompound in the upper half, the branching of the 2–3-pinnate deltoid ascending pinnæ between flabellate and compound, the ultimate divisions reaching 2–3 in. long, $\frac{1}{6}$–$\frac{1}{8}$ in. broad. Leaves of the lower plane crowded, ascending, ovate, acute, $\frac{1}{2}$–1 lin. long, bright green, rigid, slightly dilated on the upper side at the base, broadly rounded, obscurely ciliated, much imbricated over the stem; leaves of the upper plane one-third as long, oblique ovate, not cuspidate. Spikes square, $\frac{1}{4}$–1$\frac{1}{4}$ in. long, $\frac{3}{4}$–1 lin. diam.; bracts rigid, lanceolate-deltoid, acuminate, strongly keeled.

Hab. On the Rio Negro, near San Carlos, *Spruce* 2501!

238. S. PUBERULA Spring Mon. ii. 165. — Stems erect, stramineous, reaching a length of 2–3 ft., simple towards the base, branched upwards, pubescent; pinnæ short, erecto-patent, sparingly compound; pinnules few, distant. Leaves of the lower plane ovate, contiguous, ascending, falcate, very acute, bright green, rigid, $\frac{1}{2}$–1 lin. long, dilated on the upper side at the base, distinctly ciliated, and imbricated over the stem; leaves of the upper plane half as long, oblique ovate, serrulate, cuspidate. Spikes short, square, 1 lin. diam.; bracts ovate-cuspidate, strongly keeled.

Hab. British Guiana, *Richd. Schomburgh* 979! Padauiri

River, Amazon Valley, *Traill* 1417 ! Mount Guayrapurina, Eastern Peru, *Spruce* 4054 !

239. S. Haenkeana Spring Mon. ii. 187.—*S. dimorpha* Klotzsch. — Stems about a foot long, erect, simple near the base, with spreading leaves, deltoid and decompound in the upper three-quarters, the lower pinnæ 3–4-pinnate, the contiguous ascending final segments ¼–½ in. long, 1-12th to 1-8th in. broad. Leaves of the lower plane contiguous, ascending, oblong-lanceolate or oblique ovate, acute, 1-12th to 1-8th in. long, bright green, membranous, dilated, strongly ciliated, much rounded, and imbricated over the stem on the upper side at the base; leaves of the upper plane small, oblique obovate, with a cusp as long as the lamina. Spikes short, square, ½ lin. diam.; bracts ovate-lanceolate, strongly keeled.

Hab. French Guiana, and, according to Spring, also Bolivia and Chili. A near ally of *S. flabellata*.

240. S. viticulosa Klotzsch in Linnæa xviii. 524.—Stems about a span long, stramineous, simple in the lower part, deltoid and decompound upwards, the pinnæ deltoid, 2–3-pinnate, the root-fibres sometimes extending to the axils of the lowest pinnæ, the contiguous ascending final segments ½–1 in. long, 1-12th to 1-8th in. broad. Leaves of the lower plane contiguous, ascending, lanceolate or oblique ovate, acute, 1-12th to 1-8th in. long, bright green, moderately firm in texture, broadly rounded, shortly ciliated, and much imbricated over the stem on the upper side at the base; leaves of the upper plane one-third as long, oblique ovate, cuspidate. Spikes square, ½ lin. diam.; bracts ovate-cuspidate, strongly keeled.

Hab. Central America and Venezuela. A near ally of *S. flabellata*.

241. S. Hartwegiana Spring Mon. ii. 188.—Stems about a foot long, erect, stramineous, simple in the lower half or third, with adpressed leaves, deltoid and decompound upwards, the deltoid pinnæ 3–4-pinnate, the ascending contiguous final segments ½–1 in. long, 1-12th to 1-8th in. broad. Leaves of the lower plane contiguous, ascending, ovate, falcate, very acute, 1-12th to 1-8th in. long, bright green, moderately firm in texture, nearly equal-sided, broadly rounded, shortly ciliated, and a little imbricated over the stem on the upper side at the base; leaves of the upper plane one-third as long, broad ovate, cuspidate. Spikes short, square, ¾ lin. diam.; bracts ovate-lanceolate, strongly keeled.

Var. *S. leptoblepharis* A. Br. in Crypt. Nov. Gran. 363. — Less compound, with the leaves of the upper portion of the unbranched part of the stem spreading.

Hab. Andes of New Granada and Ecuador.

242. S. erythropus Spring Mon. ii. 155.—*Lycopodium erythropus* Mart. Icon. Crypt. tab. 20, fig. 3.—Stems about a span long, bright crimson, simple in the lower half or third, deltoid and decompound upwards, the lower pinnæ deltoid 3-pinnate, the ascending contiguous final branchlets ½–1 lin. long, 1-12th to 1-8th in. broad. Leaves of the lower plane contiguous, ascending, oblong- or ovate-lanceolate, acute, 1-12th to 1-8th in. long, bright green, moderately

firm in texture, unequal-sided, broadly rounded, strongly ciliated, and imbricated over the stem on the upper side at the base; leaves of the upper plane half as long, oblique ovate, cuspidate. Spikes square, ½ lin. diam; bracts ovate-cuspidate, strongly keeled.

Var. *major* Spring. — More compound, the unbranched part of the stem longer, and all its leaves adpressed.

Hab. Tropical America, from the West Indies and Guatemala to Chili and Central Brazil. *S. setosa* Hort. is a starved small form of this species.

243. S. HÆMATODES Spring Mon. ii. 156. — *S. filicina* Spring Mon. ii. 189. — *Lycopodium hæmatodes* Kunze Farn. t. 30. — Stems 1–2 ft. long, bright crimson, unbranched in the lower half, with its leaves much spaced and adpressed, deltoid and decompound in the upper half, the deltoid pinnæ 3–4-pinnate, the contiguous erecto-patent ultimate divisions ¼–1 in. long, ⅛–⅙ in. broad. Leaves of the lower plane contiguous, ascending, ovate- or oblong-rhomboid, acute, ⅙–⅓ in. long, bright green, moderately firm in texture, dilated on the upper side at the base, not ciliated, broadly rounded, and a little imbricated over the stem; leaves of the upper plane minute, oblique oblong, with a large cusp. Spikes square, reaching 1–1½ in. long, ½–¾ in. diam.; bracts ovate-lanceolate.

Hab. Andes of Venezuela, Ecuador, and Peru. One of the handsomest of all the known species. Frequent in cultivation.

244. S. AMAZONICA Spring Mon. ii. 176. — *S. amazonum* Spring in Mart. Fl. Bras. i. 124, t. 6. — Stems 2 ft. or more long, stramineous, erect, simple in the lower half, with adpressed leaves, deltoid and decompound in the upper half, with long closely regularly pinnate pinnæ, with contiguous erecto-patent simple or slightly compound pinnules, the ultimate divisions reaching 1–2 in. long, ⅙ in. broad. Leaves of the lower plane contiguous, erecto-patent, lanceolate- or oblong-rhomboid, subacute, 1-12th to 1-6th in. long, bright green, moderately firm in texture, nearly equal-sided, rounded on the upper side at the base and a little imbricated over the stem, cuneate-truncate on the lower; leaves of the upper plane one-third as long, oblique ovate, acute. Spikes square, ½–1 in. long, 1 lin. diam; bracts ovate-lanceolate, strongly keeled.

Hab. Amazon Valley, *Martius*, *Spruce* 2053 ! 2358 !

245. S. OAXACANA Spring Mon. ii. 177. — Stems 1½–2 ft. long, erect, stramineous, simple in the lower half, with adpressed leaves, deltoid and decompound in the upper half, the leaves of the main stem ovate-oblong, obtuse, very ascending, the pinnæ elongated, closely 3–4-pinnate, the contiguous erecto-patent final divisions ¼–1½ in. long, ⅛–⅙ in. broad. Leaves of the lower plane subcontiguous, erecto-patent, lanceolate-rhomboid, subacute, 1-12th to 1-6th in. long, dark green, moderately firm in texture, dilated, broadly rounded, not ciliated, imbricated over the stem on the upper side at the base; leaves of the upper plane one-third as long, oblong, shortly cuspidate. Spikes short, square, ½ lin. diam.; bracts ovate-cuspidate, strongly keeled.

Hab. Mexico, in the Province of Oaxaca, *Galeotti* 6808 *bis* Chiapas, *Gheisbrecht* 602 ! A near ally of *S. flabellata*.

246. S. ANCEPS A. Br. in Fil. Nov. Gran. 362. — *S. Sprucei* A. Br., *loc. cit.*—*S. flabellata* Spring, ex parte. —*Lycopodium anceps* Presl.—Stems 1–2 ft. long, erect, stramineous, simple in the lower half, with entirely adpressed leaves, deltoid and 2–3-pinnate in the upper half, the contiguous erecto-patent ultimate segments reaching 2–3 in. long, $\frac{1}{4}$–$\frac{1}{3}$ in. broad. Leaves of the lower plane crowded, ascending, lanceolate-rhomboid, acute, $\frac{1}{6}$–$\frac{1}{3}$ in. long, bright green, moderately firm in texture, dilated, cordate, shortly ciliated, and much imbricated over the stem on the upper side at the base; leaves of the upper plane one-third as long, oblique ovate, acute. Spikes square, reaching 1–$1\frac{1}{2}$ in. long, 1 lin. diam.; bracts ovate-lanceolate, strongly keeled.

Hab. Andes of Venezuela, New Granada, Ecuador, and Peru. Habit less compound than in *flabellata*, and leaves much larger.

Series VI.—Caulescentes.

Group 2.—Geniculatæ.

247. S. PARKERI Spring Mon. ii. 226. — *S. lucidinervia* Spring. — *Lycopodium Parkeri* Hook. & Grev. — *L. plumosum* Aublet!—Stems 1–$1\frac{1}{2}$ ft. long, simple in the lower half or two-thirds, articulated, stramineous, distinctly articulated, deltoid and decompound in the upper part, with petioled bipinnate deltoid lower pinnæ, long lanceolate penultimate divisions with a flexuose rachis, and contiguous erecto-patent final divisions $\frac{1}{2}$–1 in. long, $\frac{1}{4}$–$\frac{1}{3}$ in. broad. Leaves of the lower plane contiguous, lanceolate-rhomboid, ascending, pointed at the upper corner, $\frac{1}{6}$–$\frac{1}{4}$ in. long, bright green, moderately firm in texture, auricled on both sides of the narrow base, unequal-sided, broadly rounded on the upper side at the base, and a little imbricated over the stem; leaves of the upper plane one-third to one-quarter as long, lanceolate, acute. Spikes short, square, 1 lin. diam.; bracts ovate-cuspidate, acutely keeled.

Var. *S. pedata* Klotzsch in Linnæa xviii. 521. — *S. nodosa* Kunze. — Branched portion of the stem more compound, with narrower divisions, shorter leaves of the lower plane, and longer more slender spikes.

Var. *S. stellata* Spring Mon. ii. 228. — *S. calcarata* A. Br. in Crypt. Nov. Gran. 389. — Upper part of stem copiously compound. lengthened out, and taking root at the tip.

Var. *S. Vanheurckiana* Spring.—*S. fragilis* A. Br. in Crypt. Nov. Gran. 389. — Stems slender and trailing, bipinnate above the simple base, gradually lengthened out upwards with a long whip-like radicant end.

Hab. Guiana and the Amazon Valley. This is probably the "planta muscosa et plumosa guayanensis perelegans minor" of Breynius Ic. t. 101, cited by Linnæus under his *L. plumosum*.

248. S. ASPERULA Spring Mon. ii. 225. — *Lycopodium asperulum* Mart. — Stems about a foot long, erect, articulated, stramineous, simple in the lower half with adpressed leaves, compound in the upper half with broad erecto-patent pinnæ 2–4 in. long, with distant sparingly subflabellately compound erecto-patent pinnules,

the final divisions ½–1 in. long, 1-12th in. diam. Leaves of the lower plane crowded, ascending, ovate, acute, ½–1 lin. long, bright green, firm in texture, broadly rounded and shortly rigidly ciliated on the upper side at the base, and a little imbricated over the stem; leaves of the upper plane one-third as long, oblique ovate, acute. Spikes short, square, ¾–1 lin. diam.; bracts ovate-cuspidate, sharply keeled.

Hab. Amazon Valley, *Spruce* 1317! *Traill* 1420! 1421! Ceara, *Gardner*. Bahia, *Martius*!

249. S. GENICULATA Spring Mon. ii. 227. — *S. ferruminata* and *conduplicata* Spring Mon. ii. 229–230. — *S. elongata* Klotzsch.— *Lycopodium geniculatum* Presl. — Stems 2–3 ft. long, simple, stramineous and very distinctly jointed in lower two-thirds or three-quarters, deltoid and decompound upwards, with 3-pinnate lower pinnæ, all the divisions ascending and pinnately arranged, the final ones contiguous, 1–2 in. long, ⅛–¼ in. broad, their rachis also, like the main stem, conspicuously articulated. Leaves of the lower plane contiguous, ascending, ovate or ovate-lanceolate, acute, 1-12th to 1-6th in. long, bright green, moderately firm in texture, truncate at the base, not at all imbricated over the stem, entire or obscurely serrulate; leaves of the upper plane one-third as long, ovate-lanceolate. Spikes square, ½–¾ lin. diam.; bracts ovate-cuspidate, strongly keeled.

Var. *S. tomentosa* Spring Mon. ii. 231. — Branches pubescent, divisions ⅙–½ in. broad.

Hab. Costa Rica and Nicaragua to the Amazon Valley and Peru.

250. S. SUBARBORESCENS Hook. 2 Cent. Ferns, t. 84. — *S. euryclada* A. Br. in Crypt. Nov. Gran. 388. — Stems reaching a height of 4–5 ft., simple and unbranched in the lower three-quarters, stramineous, distinctly articulated, deltoid and frond-like at the top, with long-stalked ascending lower bipinnate pinnæ, with the branching midway between flabellate and pinnate, the final divisions reaching 4–6 in. long, ½ in. broad. Leaves of the lower plane contiguous, lanceolate-rhomboid, patent with a falcate acute tip, ¼–⅓ in. long, bright green, moderately firm in texture, nearly equal-sided, not imbricated over the stem at the base, cut away on the upper, produced and square on the lower side; leaves of the upper plane one-quarter as long, lanceolate, acute, much imbricated. Spikes short, square, 1 lin. diam.; bracts ovate-cuspidate, acutely keeled.

Hab. Amazon Valley, in forests of the Rio Uapes, *Spruce* 2540!

Subgenus III.—HOMOSTACHYS.

251. S. CILIARIS Spring Mon. ii. 233, excl. syn. — *Lycopodium ciliare* Retz. — Habit of *S. serpens*. Stems trailing, reaching ½ ft. in length, pinnate, the branches erecto-patent, the lower copiously compound. Leaves of the lower plane spaced below the tip of the branchlets, spreading, ovate-oblong, subobtuse, ⅛ in. long, very unequal-sided, cordate and conspicuously ciliated, and imbricated over the stem on the upper side at the base; leaves of the upper

plane much smaller, cordate-ovate, aristate. Spikes short, not resupinate; bracts of both planes resembling the leaves in shape and arrangement.

Hab. Ceylon, *Kœnig*. I have not found this amongst our large set of Ceylon specimens. Of the synonyms cited by Spring Lamarck's plant is our *S. proniflora*, and Hooker & Greville's is *S. tenera*.

252. S. PALLIDISSIMA Spring Mon. ii. 234.—Stems 3–6 in. long, much intermatted, forked low down and pinnate, the branches simple or sparingly compound. Leaves of the lower plane spaced below the tip of the branches, spreading, ovate, acute, a line long, pale green, membranous, very unequal-sided, very cordate on the upper side at the base, shortly ciliated, much imbricated over the stem; leaves of the upper plane half as long, ovate, shortly cuspidate. Spikes not resupinate, $\frac{1}{2}$–1 in. long, $\frac{1}{8}$ in. broad, sometimes forked; bracts of the lower plane ovate, acute, erecto-patent, slightly imbricated; of the upper plane little smaller, suberect, much imbricated.

Hab. Temperate region of the Central Himalayas, ascending in Kumaon to 8000–9000 ft.

(To be continued.)

A NEW *SELAGINELLA* FROM NEW GUINEA.

By J. G. Baker, F.R.S.

I am just too late to have intercalated in its proper place in my synopsis the following new species, from New Guinea, of which we have received, through the kindness of Baron von Mueller, four specimens, three of them collected near Port Moresby by Edelfeldt, and a fourth on the islands of the south-east coast by Armit. It belongs to the *Caulescentes* group of the subgenus *Stachygynandrum*, and much resembles a dwarf edition of the widely-spread and well-known *S. flabellata*.

213* **S. Muelleri**, Baker, n. sp.—Stem erect, 6–8 inches long, simple in the lower half or third, decompound upwards; pinnæ crowded, deltoid; final branches close, erecto-patent, $\frac{1}{2}$–$\frac{3}{4}$ lin. diam. Leaves of the lower plane ovate-lanceolate, $\frac{1}{2}$–$\frac{3}{4}$ lin. long, ascending, rather imbricated on the branchlets, bright green, moderately firm in texture; base rounded on both sides; midrib central; margin white, denticulate, not anywhere distinctly ciliated. Leaves of the upper plane oblique ovate-cuspidate, about half as long, much imbricated. Spikes short; bracts ovate-cuspidate, bright green, as long as the leaves of the lower plane.

A NEW *DENDROBIUM* FROM SIAM.

By H. N. Ridley, M.A., F.L.S.

Dendrobium atractodes, n. sp. — Aff. *D. aureo* Lindley, pseudobulbis pluribus fusiformibus paullo complanatis, subpedalibus; floribus iis *D. aurei* æquantibus; sepalis anguste lanceolatis obtusis petalis latioribus, omnibus cereis labello ovato rotundato minute pubescenti, margine minute fimbriato, stramineo versus basin obscuriore, maculis duabus purpureis; columna brevi, viridi; anthera roseo-tincta. Siam: introduced by Mr. Thomas Christy, F.L.S.

This plant is remarkable for the shape of the pseudobulbs, which are narrowed at the base and apex, swelling out in the middle so as to be fusiform and slightly flexuous. There were ten on the plant, the longest about nine inches long and half an inch thick. The only flower which I have seen differs from that of *D. aureum*, not only in colouring, but in the more open shape of the lip.

NOTICES OF BOOKS.

The Botanical Record Club: phanerogamic and cryptogamic. Report for the year 1883. By the Referees and Editor. Manchester: printed by James Collins & Co. 1884. 8vo, pp. 1–76, 253–255.

This Report contains, like its predecessors, much that is interesting. Now that the "voucher-specimens" of the Club have been transferred to the British Museum, and are thus easily available for reference, the semi-private nature of these reports has to a great extent been done away with, and the drawback to the general usefulness of the work of the Club has been removed. The editor is, we believe, Mr. F. A. Lees, although we find no statement to that effect in the report itself. The preface contains a reasonable complaint that the new county records of preceding reports were not incorporated into the new edition of 'Topographical Botany.' In some cases, however, the work referred to appears to have been carelessly consulted, as in the section headed "Record of species not considered worthy of comital enumeration in 'Topographical Botany," where, of the first six plants mentioned, the distribution of four is duly recorded in 'Topographical Botany.'

A large number of the more interesting "new county records" have already been published in this Journal. The occurrence of *Erica vagans* in Bulmershe Park, Earley, Berks, "in which park are many planted conifers," should hardly appear under this heading. The differences of opinion upon certain plants finds plentiful illustration: thus, in the *Ranunculus conferroides* of Rescobie Loch (see Journ. Bot. 1880, p. 344), Mr. Druce sees only "a depauperated form of *R. circinatus*." Mr. Baker contents himself by saying "not *circinatus*," and Mr. Lees thinks it a "starved alpine state of *trichophyllus*." The Malvern Rose, found by Mr. Towndrow (see Journ. Bot. 1883, 219), appears as "*Rosa sempervirens* L., var. *Melvini* Towndrow," without any description. Mr. Baker "expects it is a strange *stylosa* form:" Mr. Lees "does not see the difficulty in regarding this as a long-leaved form of the Continental *sempervirens*," and "considers it a nurseryman's variety and a stray." We suspect some confusion in the various records given for *Orchis incarnata*. The "new station" given for *Dentaria* will be found at page 185 of this Journal for 1882. The circumstances of the addition of *Myosotis rupicola* "to the flora of the field botanists' classic county" have already been given in our pages (Journ. Bot. 1875, p. 26). In connection with the recent discussion in this Journal as to the position of the Holyhead *Senecio*, it is interesting to note that a South Lincoln form of *S. campestris* is described as "tall, 18 inches to 2 feet high, lower leaves spathulate on longish stalks, upper spathulate-lanceolate, sessile, all cottony, most below, slightly decurrent, slightly branched above, with from 5 to 10 long peduncled heads." Mr. Lees has "not seen the early radical leaves, but in faces this comes very close to the Holyhead plant." If Mr. Lees is correct in believing that "the station whence the above variety was gathered was the very same as that in which the Rev. G. S. Streatfeild first gathered the plant" in 1873, we do not see why it is included in the "New Locality List." Indeed we are strongly of opinion that a careful examination of this list would greatly diminish its extent. As the name of Mr. W. W. Reeves occurs among the "deaths," it may be desirable, as it is pleasant, to say that this statement is incorrect.

Sylloge Fungorum omnium hucusque cognitorum. Digessit P. A. Saccardo. Vol. iii. Sphæropsideæ et Melanconieæ. Patavii, xv Decembris, 1884, sumptibus Auctoris typis Seminarii. 8vo, pp. 860.

We are glad to announce the issue of the third volume of this work, for although confessedly only a compilation, it is exceedingly useful for collecting together into one focus all the stray scintillations of mycological genius in the direction of species-making, which have hitherto been too much diffused to enlighten anyone, save at the cost of great labour.

The present volume of 860 pages is devoted to the *Sphæropsideæ* and *Melanconieæ*, including 4212 species, or at least so-called species. The only drawback is that—of the majority at least—no sane mycologist believes them to be autonomous species. In many cases whole genera are known to be only imperfect conditions of other Fungi; hence we must be permitted to doubt whether it would not have been wiser to have referred them to their proper species, and not have continued to perpetuate spurious genera or species, such as *Cytispora*, and many others. The present volume will greatly assist any future reformer, who, instead of dealing with names, will work at the things themselves, and transfer the imperfect forms to the species to which they belong. We even venture to think that in some instances Prof. Saccardo might have reduced bulk by reducing species, as, for instance, at page 108, where No. 260, *Phoma vixvisibilis*, and No. 264, *Phoma innumerabilis*, are evidently the same species, growing on the same host, in the same locality, and differ only in name.

There is a bulky index of 43 pages, which, if accurate, is always a great boon, deserving of commendation. Unfortunately, practice has proved that the Index to the previous portion of the work was not so accurate as it might have been, and even in this we fail to see the advantage of an alphabetical arrangement which places U, V, Y, K, X, W, and Z in sequence. Not being well acquainted with the Italian alphabet, we cannot say if such a sequence is usually adopted. At the risk of increasing the bulk we would also have been glad to have found more synonyms in the Index, as we have sought in vain for something to correspond to *Crebella andropogonis*, described and figured by Berkeley many years ago. *Diplodia salicina* Lev., though alluded to under No. 2009, has escaped us. *Sphæropsis Mappæ* Cke. (Grevillea, x., 123) makes no sign in the Index, and *Hendersonia elegans* Berk. is not to be found either there or in the genus *Staganospora*.

We would also be glad to learn what benefit accrues to botany by the pedantic alteration of the orthography of generic names, such as *Cytospora* for *Cytispora*, *Næmospora* for *Næmaspora*, and *Steganosporium* for *Stegonosporium*, especially after having been in use for about half a century in their original form.

The total change of specific names is also made in some instances without apparent justification. Under No. 2275 the original *Diplodia hyalospora* C. & E. is changed to *Diplodina Ellisii* Sacc., and no cause is assigned, although *hyalospora* does not appear in the same genus. On the other hand, by means of changed specific names in *Asteroma*, we get two (Nos. 6 and 56) that are identical in one genus.

Changes are also made in generic names, to which we take a strong objection. Why is *Topospora*, Fries Fl. Scan. 1835, set aside, and *Mastomyces*, Mont. 1848, adopted; although, by the way, *Mastomyces* is omitted from the alphabetical index to the genera? Again, for what reason has *Thyrsidium*, Mont. 1836, been adopted, to the exclusion of *Cheirospora*, Fries Syst. Orb. Veg. (1825)? Surely not for any petty personal reason, we hope, although under strong suspicion. Already there is a genus *Thyridium** in the second volume, and it is manifestly impolitic to employ two names which only differ in a single letter. Why should an author with so fertile an imagination give us such genera as the following:—*Cytospora*, *Cytosporina*, *Cytosporella*, and *Cytosporium*; as well as *Thyridium*, *Thyridaria*, and *Thyrsidium*; or *Calosphæria* and *Cœlosphæria*; or *Massaria*, *Massariella*, *Massarina*, and *Massariovalsa*; or *Cryptosphæria*, *Cryptosphærella*, *Cryptospora*, and *Cryptosporella*? And in specific names in the same genus (*Phoma*), why have we (169) *tamaricaria*, (172) *tamaricella*, (173) *tamaricina*, and (174) *Tamarisci*?

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* *Thyridium* is also a genus of Mosses.

In the "Laws of Botanical Nomenclature" the two following paragraphs are well deserving of notice:—"Avoid in the same genus names too similar in form—above all, those that only differ in their last letters" (p. 27).

"The essential point in nomenclature is to avoid or reject the use of forms or names that may create error or ambiguity, or throw confusion into Science. Next in importance is the avoidance of any useless introduction of new names." And yet, without any assigned reason, the genus *Schizothyrium* Libert. is changed to the more recent *Schizothyrella* Thum.

Another appeal to law gives us this caution: "To avoid taking up names that have already been used, but have not been approved, and applying them to genera different from the former" (p. 25). It is undoubted that this has been done in the case of *Aposphæria*, *Fuckelia*, and *Cryptostictis* (called *Cyptosticis* in Index). In the first instance the original type-species is excluded, in the second the name is already employed in Pyrenomycetes (see Grevillea, xii. 50), and in the last instance the external characters, which justified the name, are expunged, and half the original generic characters only accepted, under the same name as the whole, in order to avoid accepting another name, proposed in 1878, for the genus as now adopted. "Perithecia elliptica, innata, cum rima oblongo-lineari dehiscentia; disco carnoso, excavato"—this portion is excluded, and in place thereof the following is adopted:—"Perithecia erumpentia, globosa vel depressa, pertusa, subinde spuria." We contend, therefore, that the alteration is no more nor less than the construction of a *new* genus, and applying the *old* name; and that the name of *Dochmolopha*, proposed in 1878, has the precedence.

Nevertheless we are not prepared to contest so strongly the principles of classification adopted, as applied to the species included in this volume, as in those devoted to the Pyrenomycetes. Some exceptions might be taken, without doubt on very plausible grounds, to certain of the genera which are made to include too much (*Phoma*, for instance), and others too little.

We observe that the Hyphomycetes are in progress, and it is hoped during next year to produce the first volume of the Hymenomycetes. With 6100 Pyrenomycetes, 4212 *Sphæropsideæ* and *Melanconieæ*, and the Discomycetes, the Hyphomycetes, the Hymenomycetes, and the Æcidiomycetes and Schizomycetes still to come, we cannot fail to contemplate the total in prospect with dismay. Perhaps after all this there may remain some work of reform to be accomplished. The publication of the present work will at least prepare the way, and no mycologist can consider his library complete without it. M. C. C.

New Books. — F. Hueppe, 'Die Methoden der Bakterienforschung' (8vo, pp. viii,, 174, tt. 2, Wiesbaden, Kriedel).—W. Grohmann, 'Ueber die Einwirkung des zellenfreien Blutplasma' 8vo, pp. 32: Dorpat, Krüger.—C. Mylius, 'Das Anlegen von Herbarien' (8vo, pp. vi., 108: Stuttgart, Hoffman).—J. Weisner, 'Elemente der Anatomie und Physiologie der Pflanzen,' ed. 2

(8vo, pp. x., 316, 125 cuts : Wien, Hölder.) — A. Gravis, Récherches Anatomiques sur les organes végétatifs de l'*Urtica dioica*' (4to, pp. x., 256, tt. 23 : Bruxelles, Manceaux).—F. O. Bower & S. H. Vines, 'A Course of practical instruction in Botany' (Part i., Phanerogamæ—Pteridophyta. 8vo, pp. vii, 226 : Macmillan, 6s.).—J. Vesque, 'Traité de Botanique agricole et industrielle' (8vo, pp. xvi., 976 ; 597 cuts; Paris, Baillière).— D. Cauvet, 'Cours Élémentaire de Botanique : i., Anatomie et Physiologie Végétales' (pp. viii., 468 ; 404 cuts). ii., 'Les Familles des Plantes' (pp. 468 ; 373 cuts) (8vo, Paris, Baillière). — H. Correvon, 'Les Plantes des Alpes' (8vo, pp. 264 : Genève, Carey).

Articles in Journals.

American Naturalist. — E. L. Sturtevant, 'Indian Corn and the Indian.'

Bot. Centralblatt (Nos. 9, 12). — C. Kraus, 'Ueber Blutung aus parenchymatischen Geweben.' — (Nos. 9–11). T. Sterzel, 'Zur Culmflora von Chemintz-Hainichen.' — (No. 10). H. Bruchmann, 'Das Prothallium von *Lycopodium*.' — (No. 11). M. M. Hartog, 'Organogenic Notes.'

Botanical Gazette (Feb.). — W. G. Farlow, 'Notes on Fungi.' — M. S. Bebb, '*Salix macrocarpa* Nutt., not of Andersson.' — G. Vasey, 'New Grasses' (*Bromus Suksdorfii*, *B. Orcuttianus*, *Deyeuxia Cusickii*, *Deschampsia gracilis*, spp. nn.). — (Mar.). W. G. Farlow, 'The *Synchytria* of the United States' (*Synchytrium Holwayi*, *S. innominatum*, spp. nn.).

Botanische Jahrbücher. — F. Buchenau, 'Die Juncaceen aus Indien' (*Juncus chrysocarpus*, *J. leptospermus*, *J. Clarkei*, *J. bracteatus*, *J. sphenostemon*, spp. nn. ; 2 plates). — E. Hackel, 'Die auf der Expedition 'Gazelle' von Dr. Naumann gesammelten Gramineen' (*Panicum tabulatum*, *Chamæraphis gracilis*, *Andropogon superciliatus*, *Anadelphia* (gen. nov.) *virgata*, *Agrostis paucinodis*, *Chloris pallida*, spp. nn.). — H. Dingler, 'Der Aufbau des Weinstockes' (1 plate).—A. Engler, 'Araceæ Lehmannianæ' (*Anthurium pulchellum*, *A. popayanense*, *A. cuncanum*, *A. carinatum*, *A. truncatulum*, *A. hygrophilum*, *A. lactiflorum*, *A. tolimense*, *A. cupreum*, *A. sanguineum*, *A. subtriangulare*, *A. denudatum*, *Philodendron cuneatum*, *P. Lehmanni*, *P. montanum*, *Dieffenbachia daguensis*, *D. Enderi*, *Caladium steudneriæfolium*, spp. nn.). — Id., *Schinopsis Balansæ*, sp. n. (Paraguay, Balansa, 3188).

Bot. Zeitung (Feb. 27). — J. Reinke, 'Die Zerstörung von Chlorophyllösungen durch das Licht und eine neue Methode zur Erzengung des Normalspectrums.' — (Mar. 6, 13). H. Hoffmann, 'Ueber Sexualität.' — (Mar. 20). M. Woronin, 'Notiz über die Structur der Blätter von *Statice monopetala* L.' (1 plate).

Bull. Bot. Soc. France (xxxii., pt. i.). — A. Franchet, 'Plantes du Yun-nan recoltées par M. l'Abbé Delavay' (*Anemone cœlestina*, *Ranunculus yunnanensis*, *Guldenstaedtia Delavayi*, *Saxifraga Delavayi*, *Chrysosplenium yunnanense*, *C. Delavayi*, *Morina Delavayi*, *Cyananthus barbatus*, *Rhodendron cephalanthum*, *R. campylogynum*, *Androsace* *strigillosa*, *Cypripedium plectrochilum*, *Asplenium yunnanense*, *Scolopendrium Delavayi*, *Aspidium acanthophyllum*, *Polypodium yunnanense*, *P. glaucopsis*, spp. nn.). — P. Van Tieghem, 'Sur les canaux à gomme des Sterculiacées.' — E. Prillieux, 'Sur les fruits de *Stipa* qui percent la peau des moutons russes.' — E. Bornet, 'Algues de Madagascar recoltées par M. Ch. Thiébaut' (*Constantinea? Thiebauti*, sp. n.). — R. Zeiller, 'Sur les affinités du genre *Laccopteris*.' — L. du Sablon, 'Sur le sporogone des Hepatiques et le rôle des elatères.' — G. Rouy, 'Deuxième note sur le *Melica ciliata*.' — J. Poisson, 'Sur le genre nouveau *Hennecartia* de la famille des Monimiacées' (*H. omphalandra*, sp. unica), Paraguay, Balansa, 2342). — N. Patouillard, '*Pistillaria bulbosa*, sp. n.' — J. Vallot, 'Plantes rares de Cauterets.'

Gardeners' Chronicle (Mar. 14, 21). — *Cattleya Laurenciana* Rchb. f., sp. n. (figs. 68 & 69). — (Mar. 14). C. T. Druery, 'Discovery of Apospory in Ferns.' — *Pinus Thunbergii* (fig. 63). — J. W. H. Trail, A. S. Wilson, & W. G. Smith, 'Sclerotioids of Potato Disease' (fig. 64).—(Mar. 28). *Pinus Coulteri* (figs. 73, 74).

Journal of Mycology (Feb.). — J. B. Ellis & B. M. Everhart, 'Enumeration of North American *Cercosporæ*.' — W. Trelease, 'Heterœcismal *Uredineæ*.'

Journal of Royal Microscopical Soc. (Feb.).—G. F. Dowdeswell, 'On the Occurrence of Variations in the Development of a Saccharomyces.'

Magyar Növénytani Lapok. (Jan.).—J. Csató, 'The Flora of the Mluha Sea.'—(Feb.). L. Simkovics, 'Erroneous notes in Koch's 'Synopsis.''

Midland Naturalist. — M. C. Cooke, 'Life-history of a filiform Alga (*Œdogonium*).' — J. E. Bagnall, 'Flora of Warwickshire' (*Gramineæ*).

Nature (Feb. 19).—M. M. Hartog, 'On the Nature of Lichens.' — (Mar. 26). M. T. Masters, 'On Petalody of the Ovules, and other changes in a double-flowered form of *Dianella cærulea*.'

Œsterr. Bot. Zeitschrift. — R. v. Weltstein, *Polyporus laccatus*, sp. n. — W. Voss, 'Bildungs abweichung an der *Leucojum vernum*.' —V. v. Borbás, 'Flora von Buccari.' — F. Leithe, 'Kryptogamenflora von Tirol.' — E. Fick, 'Streifzuge in Russland.'

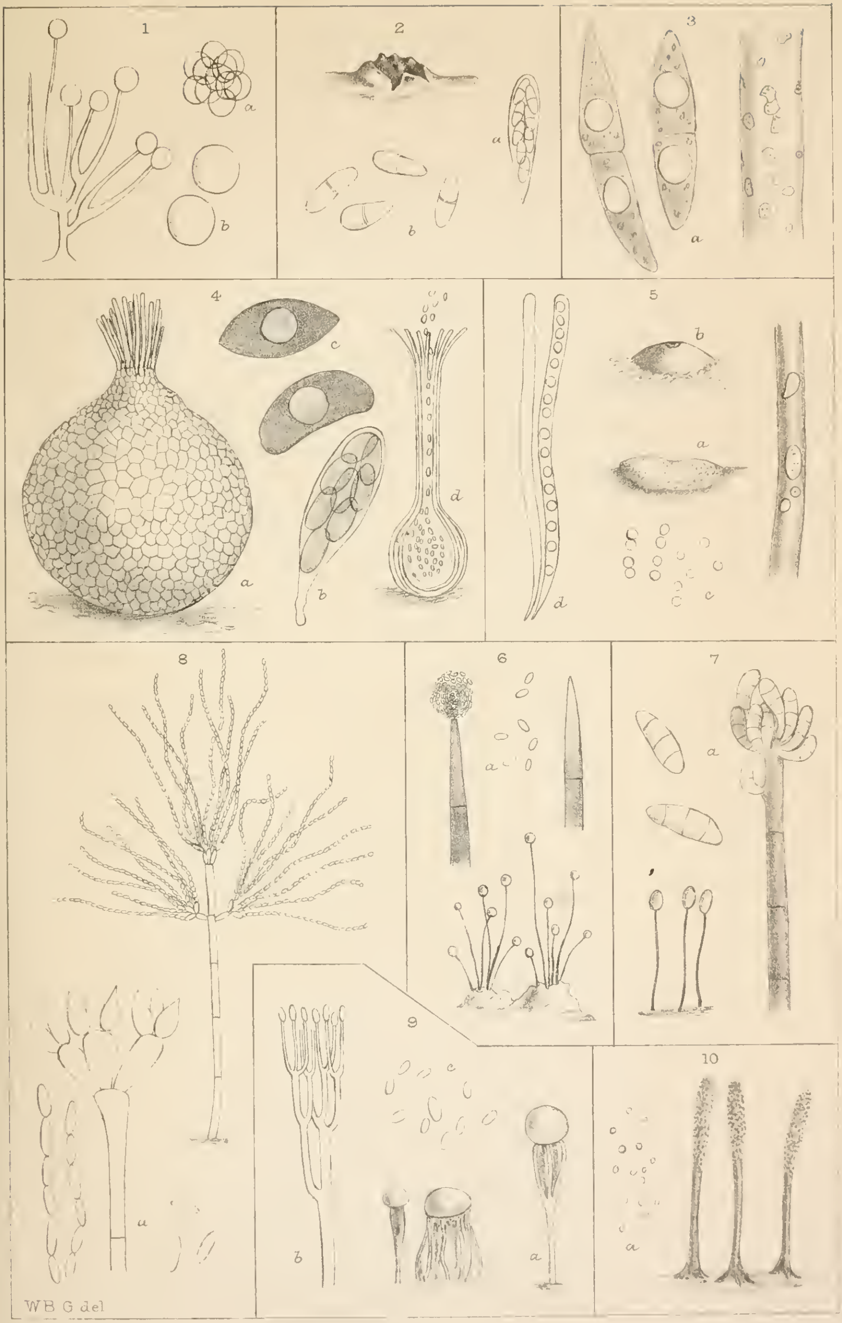
Pharmaceutical Journal (Mar. 21). — W. T. T. Dyer, 'Tea made from *Vaccinium Arctostaphylos*.'

Proc. Linnean Soc. N. S. Wales (Nov. 29). — E. Haviland, 'Notes on Plants of Sydney' (*Goodenia*). — W. Woolls, 'The *Myrtaceæ* of Australia.'

Quarterly Journal of Microscopical Science. — F. O. Bower, 'On the apex of the root in *Osmunda* and *Todea*' (2 plates). — C. B. Plowright, 'On the Life-History of certain British Heterœcismal Uredines' (The Ranunculi Æcidia, and *Puccinia Schoeleriana*, sp. n.).

Science-Gossip. — G. Holmes & E. J. Elliott, 'Mosses and Hepaticæ of Forest of Dean.'

Tab. 256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R. Morgan lith.

West, Newman & Co imp

NEW OR NOTEWORTHY FUNGI:—Part II.

By W. B. Grove, B.A.

(Tabs. 256, 257.)

This list of new or rare British Fungi is, for the most part, identical with a paper read before the Birmingham Natural History and Microscopical Society, December 2nd, 1884. The remarks which preceded Part I. (Journ. Bot., May 1884), are applicable to this also.

31. *Pistillaria rosella* Fr. Hym. Eur. p. 688.—Very minute, *subulate*, smooth, *roseate*, with a pellucid base.

On dead herbaceous stems: nettle, Sutton; cow-parsnep, Bradnock's Marsh (Wk.). August, September.

Gregarious, 1·5–2 mm. high.

**Cyphella faginea* Lib. Fr. Hym. Eur. p. 665; Bucknall, Fung. Brist. Dist. v. No. 879, pl. 2, fig. 3.

Globose, sessile, white; distinguished by the long, crowded, attenuated hairs, which are clothed with minute, prickle-like crystals.

On dead wood, Bradnock's Marsh (Wk.), July, Mr. Bucknall, having seen my specimens, agrees with me that they are identical with his. Hitherto recorded only on leaves or herbaceous stems, but he believes that he has also found this species on dead wood.

32. *Puccinia sonchi* Rob. in Desmaz. Ann. Sc. Nat. ser. 3, xi. 274 (1849); Winter, Pilze, i. 189 (1884); Grove, Sci. Gossip, xxi. 9, figs. 6–8 (1885).

II. Spots obsolete; sori small, punctiform, hypo- rarely epiphyllous, scattered or gregarious, occasionally in orbicular clusters, round or oval, about 300 μ in diam., very convex; epidermis persistent, dark brown below, hyaline and at length ruptured above; uredo spores oval, obovate, roundish or oblong, surrounded by a very thick, warted, colourless membrane, pale yellow with a few oily drops, 30–50 μ × 20–24 μ; paraphyses forming a single ring surrounding the sorus, just within the epidermis, dark brown, shining, oblong-cylindrical, clavate above, inclining inwards towards the spores, 80–100 μ × 12–15 μ.

On seedling *Sonchus arvensis*, Hampstead (St.), October. Discovered by Mr. H. Hawkes. The description is taken from his specimens; a few meso-spores were also observed. The sori appear very dark below, owing to the paraphyses showing through.

**Puccinia variabilis* Grev. Scot. Cr. Fl. pl. 75 (1824)—*P. flosculosorum* Winter, Pilze, p. 206 (1884) *p.p.*

I. Œcidium Grevillei mihi.—*Œ. Taraxaci* Grev. Flor. Edin. 444 (1824) *non* Kunze et Schm.—*Œ. compositarum*, var. *Taraxaci*, Cooke, Handb. 542 (1871); Micr. Fung. ed. iv. p. 198 (1878).

This species of Greville, which is obviously not a variety of *Œ. compositarum*, is distinguished from the *Œ. taraxaci* K. et S. which is stated to be a stage of *P. sylvatica* Schr., by the very numerous peridia, not seated on discoloured spots, "spreading over the whole leaf, and generally collected into numerous little clusters with single ones scattered between them" (Grev. *l. c.*). Specimens of both, collected by Mr. H. T. Soppitt, now lie before me. Mr. Soppitt has experimented with *Œ. Grevillei*, and is convinced that it is the I. stage of *P. variabilis*. He generally finds them both together, the upper leaves affected by the *Œcidium*, the lower ones by the *Puccinia*; after laying leaves affected with the *Œcidium* on a dandelion plant, covered with a bell-glass, in his garden, he found the *Puccinia* appear in about fourteen days. Mr. Soppitt's specimens of *Œcidium Grevillei* are from Grassington, Yorks., August. Dr. Winter's view of uniting *P. variabilis* with his *P. flosculosorum* (*compositarum*) is inexplicable.

**Puccinia sylvatica* Schröter; Winter, Pilze, p. 223 (1884).

I. *Œcidium taraxaci* K. et Schm.—*Cæoma compositatum* Link, Sp. Pl. ii. 50 (1825) *p.p.*—*P. chondrillæ* Fckl. Symb. Myc. p. 54 (1869) *p.p.* Distinguished from the preceding by the peridia being collected into rather large, dense, amphigenous clusters, seated on a coloured (often purple) spot, with usually about three or four clusters on each leaf. It resembles those *Œcidia* which were formerly embraced under the general idea of *Œcidium compositarum* Mart.

On *Taraxacum officinale*, Grange (H. T. Soppitt); Cootehill, Ireland (T. H. Moorhead).

33. *Puccinia chondrillæ* Corda, Ic. iv. 15, pl. 4, fig. 46 (1840); Fckl. Symb. Myc. p. 54 (1869) *p.p.*; Sacc. Myc. Ven. Sp. p. 80 (1873) *p.p.*—*P. prenanthis* Winter, Pilze, i. 208 (1884).

I. *Œcidium prenanthis* Pers. Syn. p. 208 (1801); (?) *non* Cooke, Handb. p. 542; Micr. Fung. ed. iv. p. 198, in *Hieracio* — *Cæoma compositatum* Link, Sp. Pl. ii. 50 (1825) *p.p.*

Cups collected in crowded irregular clusters, hypo- rarely epiphyllous, yellowish, seated on a slightly thickened spot, hemispherical, then pierced by a small pore at the apex, at length bluntly conical, with a small irregular aperture, destitute of a proper peridium. Spores irregularly roundish, obovate or polygonal, pale orange, averaging 18–25 μ long, 20 μ thick.

II. Pustules in small clusters, small, round, pale, soon naked; spores roundish, pale golden brown in mass, faintly aculeate, with unusually large thickenings round the 1–4 germinal pores, averaging 18–20 μ.

III. Pustules scattered or in small clusters, minute, roundish or elliptic to linear, darkish brown; epidermis persistent, bowl-shaped; spores elliptic or oblong, scarcely constricted, rounded above and below, on very short deciduous pedicels, 26–44 μ × 17–26 μ.

On *Lactuca muralis*, Malham, Yorks, H. T. Soppitt. Teleutospores on yellowish spots; mingled with uredo spores. The sori containing the latter alone are found earlier (in June). The

Œcidium on *Hieracium* which is sometimes assigned to *Œ. prenanthis* differs from that, according to my specimens, in the possession of a peridium, but whether that is true of Cooke's specimens (*l. c.*) I do not know. The *Œcidium* on *Lactuca* has a small unbordered opening; as Persoon says—"ore connivente, integro."

MORTIERELLA Coemans (1863).

Mucorine. Mycelium slender, dichotomous and anastomosing. Fertile hyphæ erect, pellucid, simple, or branched above or below; branches terminated in a single spherical sporangium, which has a very diffluent non-incrusted membrane, and is without columella, Endospores oval or roundish, occasionally angular or fusiform. In some species chlamydospores (of two kinds) and zygospores are also known.

34. *Mortierella Candelabrum* Van Tiegh. Rech. sur les Muc. p. 94, pl. 54, figs. 99—102 (1873); Bainier, Etude sur les Muc. p. 104 (1882). Var. MINOR mihi. Fertile stem branched from near the base with long ascending subulate branches after the fashion of a candelabrum. Spores perfectly round, smooth, hyaline, 10–12 μ diam. (Tab. 256, fig. 1).

On rotten wood, Sutton (Wk.), September. Height 1-5th to 1-3rd mm. Bainier describes the species as reaching 2 mm. in height, and the spores as oval, 6·3 μ × 2·1 μ; his specimens were on dead flies and on agarics. Van Tieghem describes it as 1 mm. high; spores 4–10 μ (average 6 μ), round; on excrement. The form here described differs in its much smaller size and much larger spores.

35. *Eutypa velutina* (Wall.) Sacc. Fung. Ven. iv. 16 (1875); Fung. Ital. 472 (1878); Syll. Pyr. i. 176 (1882); Phill. et Plow. Grevillea, xiii. 75 (1885).—*Sphæria velutina* Wallr. Fl. Crypt. iv. 844 (1833).

On *Acer campestre*, Marston Green (Wk.), May. Whether my specimens are those referred to by Messrs. Phillips and Plowright (*l. c.*) I do not know.

36. *Ceratostomella vestita*, Sacc, Mich. i. 370 (1878); Fung. Ital. 344 (1878); Syll. Pyr. i. 408 (1882) Var. VARVICENSIS mihi. Perithecia scattered, often two more or less connate, subsuperficial, black, globular, ⅓–½ mm. diam; loosely clothed with long brownish septate hairs, 200–300 μ × 4–5 μ; extended into a naked black shining curved cylindrical ostiolum, which equals or often exceeds the perithecium, and is conical and longitudinally quadrisulcate at the apex; asci cylindrical 50–55 μ × 4 μ, obtuse, shortly stipitate, 8-spored; sporidia obliquely uniseriate, ellipsoidal, 8–9 μ × 3½–4 μ, hyaline.

On decayed wood, Sutton (Wk.), October, in company with *Diplococcium spicatum* (*q. v.*). Differs from the type in the longer quadrisulcate ostiolum and the larger sporidia; the perithecium is at first semi-immersed, but at last becomes completely superficial.

37. *Melanconis aceris* Ph. et Pl. Grevillea, xiii. 76 (1885). (Tab. 256, fig. 2).

On *Acer campestre*, Marston Green (Wk.), May. For description see Grevillea (*l. c.*). I find the sporidia often 18–19 μ × 6 μ.

38. *Diaporthe Tessella* Rehm. Sacc. Syll. Pyr. i. 628 (1882) — *Sphæria Tessella* Pers. Syn. Meth. p. 48 (1801).

Perithecia arranged in a quincunx or circinnate, surrounded by a black line; ostiola subdistant, 4–7 together, appearing like black dots on the sub-convex, slightly changed portion of the bark. Asci elongate-oblanceolate 130–150 μ (pars sporif.); sporidia large, biseriate, narrowly fusoid, somewhat curved, uniseptate, scarcely constricted, filled with oleaginous granules, 55–65 μ × 11–12 μ, each cell containing a large vacuole. (Tab. 256, fig. 3).

On willow twigs, Boro' Fen, Peterboro' (Norths.), June. Conspicuous from the black ostiola, arranged somewhat like the pips on cards or dice, surrounded by a narrow black line, which is the edge of the conceptaculum. Collected during the visit of the Midland Union of Natural History Societies to Peterboro'.

39. *Leptosphæria Lucina* Sacc. Fung. Ven. ii. 311 (1875); Fung. Ital. 263 (1878); Mich. ii. 64 (1880); Syll. Pyr. ii. 52 (1883).

Spots epiphyllous, white, often with a brown border, irregular and confluent; perithecia few, rather remote, at first veiled by the epidermis, then erumpent, punctiform, globoso-lenticular, 120 μ diam., with an umbilicate broadly-pierced ostiolum; asci cylindrical-oblong, attenuated below, 65 μ × 10–11 μ, with a few filiform paraphyses, 8-spored; sporidia obliquely monostichous or subdistichous, fusoid, somewhat curved, 3-septate, slightly constricted, 18–20 μ × 4 μ, olivaceous greenish, obtuse at both ends.

On leaves of *Cytisus Laburnum*, Bradnock's Marsh (Wk.) Aug. —Oct. Detected by Prof. Saccardo on leaves, which I sent to him, affected by *Septoria Cytisi* and *Phyllosticta Cytisi*.

40. **Melanospora sphærodermoides**, sp. n.—M. peritheciis liberis, sparsis, fere lævibus, pallide luteo-fuscis, dein fuscis, semipellucidis, rotundatis vel ovatis, in rostrum breve, pilis longis subhyalinis continuis apice fimbriatum productis; ascis clavatis, stipitatis, maxime diffluentibus, 8-sporis, 80–90 μ × 30 μ; sporidiis superne visis late fusoideis, a latere oblique ovoideo-oblongis, curvatis, gutta magna instructis, hyalinis, dein olivaceis, subopacis, 30–34 μ × 15–17 μ. (Tab. 256, fig. 4).

Ad culmos *Heraclei*, apud " Bradnock's Marsh " (Wk.), August. Perithecii contextus e cellulis magnis hexagonis constat. Huic socium Sphæronema, *S. vitreo* subsimile, spermatiis oblongis, hyalinis, 6–8 μ × 2½ μ. Quoad perithecium species hæc *M. Zobelii* (Ca.) Fckl., Cooke, Handbook, p. 926 — quoad locum natalem, ascos, sporidia *Sphærodermati theleboloidi*, Fckl. magis appropinquat.

**Hypomyces candicans* Plow. Grevillea, xi. 50, pl. 157, fig. 2 (1882); Sacc. Syll. Pyr. ii. 471 (1883).

On *Stemonitis fusca*, Trickley Coppice (Wk.), September. The

perithecia were less crowded and more depressed than in the figure in Grevillea.

41. **Hypocrea placentula**, sp. nov.—Euhypocrea, stromatibus sparsis, tenuibus, discoideis, suborbicularibus, applanatis, matrice facillime separandis, albis, primo obtuitu polyporoideis; margine byssaceo, dein nudo; peritheciis stipatis, minutis, hyalino-pallidis (melleis), rotundatis, fere totis immersis; ostiolis impressis, punctiformibus; ascis cylindricis, 80–90 μ × 3–4 μ; sporidiorum monostichorum articulis globosis, hyalinis, 2½–3 μ diam. (Tab. 256, fig. 5).

Ad basin culmorum *Junci effusi*, apud "Olton Reservoir" (Wk.), September. Stromata 1–3 mm. lata. Adest simul status conidicus stromatibus minus limitatis, candidissimis; hyphis teneris, repentibus, intricatis; conidiis sporidiorum articulis similibus, conglobatis, pulveraceo-adspersis.

At the last moment before despatching this, I find described in Grevillea, March, 1885 (p. 79), under the name of *H. strobilina* Ph. et Pl., a species so closely resembling mine that it differs, so far as the incomplete description enables me to judge, only in the habitat and the larger sporidia, which are stated to be "unusually large, 5–6 × 5–5½ mm." — a size which would be indeed remarkable.

42. *Scirrhia Groveana*, Sacc. Mis. Myc. ii. pl. 9, fig. 18 (1885). — S. stromatibus atris, linearibus, plurimis in utraque foliorum pagina seriatim gregariis, bullatis, epidermide hyalina demum fissa velatis, dein pulveraceis, 1–1½ mm. longis; loculis subrotundis, pluriseriatis, confertis; ostiolis papillatis, prominulis, opacis, nigris, pertusis; ascis fusoideis, sessilibus, utrinque obtusis, sæpe leviter curvis, fasciculatis, aparaphysatis, 8-sporis, 60 μ × 12 μ; sporidiis distichis v. partim monostichis, oblongo-clavulatis, utrinque (præcipue apice) obtusis, 14–16 μ × 3½–4 μ, uniseptatis, non v. vix constrictis, nubilosis, hyalinis.

In foliis *Typhæ latifoliæ*, "Langley Pool" (Wk.), August. A *Scirrhia rimosa* satis diversa, at forte ad *Sphærellam Typhæ*, Auersw. (*nec* Fuck., *nec* Plowr., *nec* Sacc.) saltem pro parte spectans. Nondum enim fissa epidermide Sphærellam æmulatur. In iisdem foliis *Leptosphæria Michotii* Sacc.

43. *Peziza asperior* Nyl. Cooke, Grev. iii. p. 186, pl. 44, fig. 216 (1875); Mycogr. 51 (1875).

Cups aggregated in clusters, flat, bordered with a raised margin, sessile, 1–10th to 1–8th inch diam. or more, orange-scarlet, fading to yellow when dry. Sporidia globular, 20–22 μ, echinulate, rather squarish in the ascus, appearing when ejected as a shining white dust on the hymenium. Paraphyses narrowly clavate above.

On damp gravel, in a gravel-pit, between Hampton and Berkswell (Wk.), August, October. My specimens differ slightly from Cooke's description and figure, but Mr. Phillips states that they are identical. The exterior of the cups gave rise to a few very evanescent brownish hairs.

***Peziza Dalmeniensis* Cooke, Grev. iii. pp. 66, 74, pl. 34, fig. 121 (1874); Mycogr. 153 (1876); Phillips, exs. 110 (1877); Stevenson, Myc. Scot. p. 311 (1879); Grove, Mid. Nat. vi. 163 (1883); Plowright, Fung. Norf. (1884).

On the ground, among nettle stems, Sutton (Wk.), September. This rare *Peziza*, which had been previously recorded from Scotland, and from Shrewsbury, I found at Sutton in 1882, and was pleased to find it again in 1884, in still greater profusion, in the same locality. The cups appeared to be in close relation to the rootlets of the nettles. The coltsfoot (*Tussilago Farfara*) also grew among them.

**Peziza stereicola* Cooke, Grev. i. 130 (1873); iii. p. 127, pl. 40, fig. 164 (1875); Stevenson, Myc. Scot. 317 (1879); Phillips, exs. 186 (1881); Grove, Mid. Nat. vi. 163 (1883).

On the hymenium of a *Stereum*, Sutton (Wk.), September; on *S. purpureum*, Fen End (Wk.), August. This species had been previously recorded from Scotland and from Colwyn, N. Wales. I find the cups obconical, rather than globose, and covered exteriorly with a curious yellow meal; Mr. Phillips's specimens (*l. c.*) are identical.

**Vibrissea leptospora* Phill. Rev. Gen. Vibriss. in Trans. Linn. Soc. p. 8, pl. 2, figs. 19–23 (1881). — *Peziza leptospora* B. and Br. Ann. Nat. Hist. xviii. 126, pl. 4, fig. 30 (1866); Cooke, Handb. 696 (1871); Stevenson, Myc. Scot. p. 318 (1879).

On soft, previously submerged wood, Olton Reservior (Wk.), September.

**Didymium pertusum*, Berk. Eng. Fl. p. 313 (1836); Outl. p. 307 (1860); Cooke, Handb. p. 387 (1871); Myxom. p. 35 (1877); Stevenson, Myc. Scot. p. 196 (1879).

On dead *Heracleum*, Bradnock's Marsh (Wk.), October. Agreeing exactly with Berkeley's description in the umbilicus and columella, &c.

Description of Plate.

Tab. 256.—Fig. 1. *Mortierella Candelabrum*, var. *minor* × 150; *a*, group of spores from a sporangium, still cohering × 250; *b*, spores × 500. 2. *Melanconis aceris;* stroma, bursting through the bark × 8; *a*, ascus × 250; *b*, spores × 500. 3. *Diaporthe Tessella*, nat. size; *a*, spores × 500. 4. *Melanospora sphærodermoides;* *a*, perithecium × 80; *b*, ascus × 250; *c*, spores × 500; *d*, spermogone × 90. 5. *Hypocrea placentula*, nat. size; *a*, stroma × 4; *b*, ostiolum × 150; *c*, spores × 500; *d*, asci × 500. 6. *Hyalopus ater* × 150; *a*, tip of threads and spores × 500. 7. *Acrothecium tenebrosum* × 80; *a*, tip of thread and spores × 500. 8. *Spicaria elegans* × 150; *a*, tip of thread, chains of spores, and single spores × 500. 9. *Gliocladium penicillioides* × 80; *a*, a single stem × 150; *b*, tip of thread × 500; *c*, spores × 500, 10. *Pachnocybe clavulata* × 80; *a*, spores × 500.

(To be continued.)

NEW AUSTRALIAN ORCHIDS.

By R. D. Fitzgerald, F.L.S.

Prasophyllum viride, sp. n.—Stem slenderest in the group, about seven inches high. Bracts leafy, close to the flowers. Flowers not opening, green, gibbous, in spikes of about one inch, not very dense. Sepals gibbous, green, acute, without glands, about a line and a half. Dorsal sepal not quite so long, broadly hood-shaped, with acute points, without glands. Petals longer than dorsal sepals, lanceolate acute with subulate point, transparent. Labellum articulate, on very long claw, concave on under side, triangular, with blunt recurved points, and deep sinus on each side of the hinge; surface rugose, with slight depression down the centre, yellow, with red claw. Wings of column covering the stigma, bifid, the upper division twice as long as the lower, subulate, minutely ciliate; the lower blunt, not ciliate. Stigma an acute triangle, and small part only at the end near the rostellum apparently stigmatic. Anther short, with short acute point (not bearing a gland). New South Wales.

P. densum, sp. n.—Stem rather slender, about five inches high. Bract almost subulate, very close to the flowers. Flowers opening, red-brown, in dense spike, hardly more than half an inch. Sepals red-brown, about two and a half lines, narrow lanceolate acute, with fine point bearing a gland. Dorsal sepal not quite so long, hooded, lanceolate acute, bearing a gland. Petals about one line, lanceolate acute, with point bearing a gland. Labellum articulate, on long claw, linear-lanceolate acute, with a gland at the point, minutely ciliate towards the end; surface smooth and flat, light red-brown. Wings of column blunt, entire, not covering the stigma. Stigma linear-lanceolate. Anther short, with a gland at the point. New South Wales.

P. eriochilum, sp. n.—Stem slender, about ten inches high. Bract sheathing, an inch or more from the flowers. Flowers opening, brown and green, in rather open spike of about an inch. Sepals gibbous, green and brown, about one line and a half, lanceolate acute, without gland, united at the base. Dorsal sepal hooded, broadly lanceolate acuminate, without gland, minutely ciliate on the edge. Petals same length as the dorsal sepal, lanceolate, with long point but no gland, and ciliate along the upper edge. Labellum articulate, on short claw, ovate-lanceolate, with long ciliate point, the surface, except near the claw, covered with hairs, brown. Wings of column not covering the stigma, bifid, the upper division longer than the lower, both glandular along the edges. Stigma linear-triangular, with large rostellum. Anther short, with small tooth in the centre (not bearing a gland).

P. ansatum, sp. n.—Stem slender, about four inches high. Bract almost subulate, very close to the flowers. Flowers opening, red-brown and green, in rather close spike of hardly one inch. Sepals rather more than one line, lanceolate acute, with a gland at the point. Dorsal sepal rather more than half a line, hooded, broadly lanceolate, with fine points, but no glands. Petals light red-brown, half a line long, nearly straight on the upper edge, but broadly lanceolate on the lower, acute, the point bearing a gland. Labellum articulate, on rather long claw, linear-lanceolate, blunt, thickened, and glandular for about half its length towards the point, with two auricles on the edges about the middle, light red-brown. Wings of column not covering the stigma, shortly bifid, the upper tooth a little longer than the lower, acute, the lower blunt. Stigma linear, with three small glands about one-third from the rostellum, the part between them and the rostellum being probably alone stigmatic. Anther short, with subulate point, about one-third the length of the anther, and with a gland at the end.

P. longisepalum, sp. n. — Stem stouter than most of the group (except *P. viride*), about six or seven inches high. Bract linear, acute, close to the flowers. Flowers not opening, brownish yellow and green, in a rather dense spike of about one inch. Sepals linear, blunt, a quarter of an inch long, without gland. Dorsal sepals hooded, lanceolate acute, without a gland, one line and a half long. Petals shorter than dorsal sepal, falcate, thick, with gland on the inside of the blunt point. Labellum articulate, on a long claw, thick, keeled below, smooth and flat above, linear, but broader at each end than in the centre, suddenly contracted at the end into a blunt thick point, red-brown. Wings of column extending from the claw to the rostellum, overlapping the stigma, not bifid, hardly acute. Stigma linear, immersed near the rostellum in the grains of the pollen-masses. Anther short, with blunt point (not bearing a gland).

P. attenuatum, sp. n.—Stem slender, about five inches. Bract with subulate point, close to the flowers. Flowers hardly opening, almost gibbous, red-brown and green, in spike of half an inch long, and formed of about seven flowers. Sepals one line long, almost gibbous, tapering into points, which cross each other, and are terminated by a gland. Dorsal sepal a little more than half a line, hooded, broadly lanceolate acute, without gland. Petals half a line long, lanceolate acute, without gland, shorter than dorsal sepal. Labellum not articulate, ovate-acuminate, smooth, unless it be considered to be wanting, and only represented by the prolongation of the column, which in others forms the hinge, red. Wings of column covering the stigma almost to the end near the rostellum, not bifid, blunt, slightly falcate. Stigma linear-triangular. Anther short and flat, with very small gland at the apex.

P. laminatum, sp. n.—Stem very slender, about nine inches high. Bract sheathing, half an inch or more from the flowers. Flowers opening, light red, in spike of more than an inch long, formed of about twenty flowers rather far apart. Sepals one line and a half long, lanceolate, with fine point, but no gland. Dorsal sepal of the same length as the other sepals, hooded, broadly lanceolate, with fine point, but no gland, the edges thickened, and of dark red colour. Petals very slightly shorter than the sepals, lanceolate acute, without gland, a dark red line running down the centre and along the edges. Labellum articulate, on rather long claw, cordate, but not emarginate, having a small tooth in the centre, yellow, smooth, but having a broad linear red plate in the centre and thickened red edge. Wings of column not covering the stigma, extending from the claw beyond the rostellum, deeply bifid, the upper division the longer, both linear acute. Stigma lanceolate. Anther short and deep, with rather short subulate point (not bearing a gland). New South Wales.

P. reflexum, sp. n.—Stem slender, about one foot high. Bract sheathing, acute, one and a half inches or more from the flowers. Flowers opening, red-brown, in rather close spike of twenty or more flowers. Sepals two lines long, broadly lanceolate acute, united for half their length, without glands. Dorsal sepal one line and a half long, hooded, ovate-lanceolate acute, with fine point, but no gland. Petals longer than dorsal sepal, lanceolate acute, fimbriate on both edges towards the end, without gland. Labellum articulate, on short claw, thick, oblong, recurved at a right angle, the point being also recurved and fringed, having orbicular reflexed lobes about the centre, and two broad thickened longitudinal plates, red-brown. Wings of column not covering the stigma, extending from the claw beyond the rostellum, deeply bifid, the upper division acute and ciliate on the upper edge, the lower blunt, falcate, shorter than the upper. Stigma ovate-lanceolate, short. Anther short, with rather long mucronate point, bent at right angle in the centre (not bearing a gland). New South Wales.

P. filiforme, sp. n.—Stem very slender, about eight inches high. Bract sheathing, with almost subulate point, about one inch from the flowers. Flowers opening, very light yellowish red, in loose spike of about eight flowers. Sepals a quarter of an inch, recurved, united for a quarter of their length, linear-lanceolate acute, the fine point not bearing a gland. Dorsal sepal hooded, lanceolate acute, reflexed, the fine point not bearing a gland. Petals two lines long, narrow-lanceolate acute (the fine point not bearing a gland), minutely ciliate on the edges. Labellum articulate, on a short claw, oblong, lanceolate, mucronate, smooth but crinate along the edges, the point reflexed (not bearing a gland). Wings of column extending from the claw and about a fifth of its length beyond the rostellum, slightly bifid, the lower division long and almost filiform, the upper very short and crenulate. Stigma very short, oblong, with very large rostellum. Anther larger than in other closely allied species (except *P. fimbriatum*), with very long point, which is filiform, recurved twice the length of the anther itself (not bearing a gland). New South Wales.

Diuris tricolor, sp. n. — Stem more than one foot high. Leaves two, linear, channelled, four to six inches long. Bracts two or more, sheathing. Flowers six or more, yellow, with purple centre and purple claws to the petals, and with green lateral sepals. Lateral sepals from an inch to an inch and a half long, linear, deflexed. Dorsal sepal ovate, embracing the column, about half an inch long, yellow with purple centre. Labellum about four lines long, three-lobed, the lateral lobes three lines long, thick, truncate, oblong, the end denticulate, spotted with purple. Middle lobe yellow, obovate-oblong, with two thick linear glands on the disk, approaching each other at both ends, half the length of the central lobe, smooth, spotted with purple. Wings of the column not longer than the column, and embracing it in the front as well as the sides, lanceolate, crenulate towards the end. Rostellum very large. Stigma cordate, with orbicular gland at the base as large as the rostellum. New South Wales.

Pterostylis clavigera, sp. n.—A slender plant, about five inches high. Leaves radical, ovate-acute to ovate-oblong, less than half an inch long, on petioles of about the same length. Two sheathing bracts on the flower-stem more or less leafy, and about half an inch long. Flower solitary, narrow, half an inch long, abruptly curved towards the end. Lateral sepals erect, filiform from the sinus for three-quarters of an inch (that is, half their length). Dorsal sepal acute. The petals, where seen below the dorsal sepal, membranous, ovate, crenulate (as in *P. pyramidalis*). Labellum linear, obtuse, smooth. Appendage linear, dilated at the end into three pinnulate branches. Upper wing of the anther acute, and bearing a large egg-shaped gland; the lower oblong, obtuse. New South Wales.

NOTES ON THE FLORA OF CEYLON.

By Henry Trimen, M.B., F.L.S.

The last Part of the late Dr. Thwaites' 'Enumeratio Plant. Zeylaniæ' was published in 1864, and, besides completing the systematic enumeration of the plants of Ceylon to the end of the Vascular Cryptogams, contained two appendices (extending to 46 pages) of Addenda and Corrigenda, thus bringing the earlier portions of the book (which began to appear in 1858) up to the date of its conclusion.

The numbered series of *exsiccata*, well known as "C. P.," had been previously made up and widely distributed by Thwaites; their numbers are systematically quoted throughout the book, and are, in the supplements above mentioned, carried on up to C. P. 3860 inclusive.

After the completion of the 'Enumeratio' the C. P. numeration was still kept on, as new species or varieties were detected in the Island, or as further research showed the necessity of breaking up some of the previously recorded ones into two. In this way 164 additional C. P. numbers were given, and the series was extended from C. P. 3861 to 4024, which number is absolutely the last.

Many of these additional numbers have been sent out from Peradeniya to the public herbaria of Europe and Asia and to private collections, and not a few have been quoted by authors of recent monographs and descriptive treatises. It will therefore, I believe, be of use to give a list of them with their determinations, as represented in the Peradeniya herbarium, which in any case of doubt must be considered as the type series.

I may note that very nearly all these additional numbers refer to plants collected between 1864 and 1869. After this latter year Dr. Thwaites turned his attention, so far as Botany is concerned, almost exclusively to the Lower Cryptogams, and although his collectors brought in a few additional Flowering Plants, only two or three C. P. numbers refer to any year after 1869.

In the following determinations I have been often assisted by the staff of the herbariums at Kew and at the Natural History (British) Museum and have especially to thank Mr. Hemsley of the former establishment, and Mr. H. N. Ridley of the latter, for their prompt attention to my enquiries.

List of Additional C. P. Numbers.

(Names in brackets are introduced, not native, in Ceylon).

3861 Schizoloma ensifolia *J. Sm.*, var. heterophylla *Dry.* (sp.)
2 Cycas Rumphii *Miq.*
3 Dimeria laxiuscula *Thw. ms.*
4 Amomum Benthamianum *Trim. ms.*
5 Eugenia lucida *Lam.*
6 (Nephrodium moulmeinense *Bedd.*)
7 Athyrium Hohenackerianum *Moore.*
8 Cryptocoryne Beckettii *Thw. ms.*
9 Oberonia Brunoniana *Wight.*
3870 Lecanthus Wightii *Wedd.*
1 Ischæmum pilosum (*Nees*).
2 Phyllanthus cinereus *Mull. Arg.*
3 Sonerila Gardneri *Thw.*, var. firma *Trimen.*
4 Strobilanthes stenodon *Clarke.*
5 Dischidia nummularia *Br.*
6 Stenosiphonium Russellianum, var. subsericeum *Nees.* (sp.)
7 Chamæraphis spinescens *Poir.* var. subglabrum *Thw. ms.*
8 (Boswellia serrata *Roxb.*) [*ms.*
9 Bulbophyllum crassifolium *Thw.*
3880 Acrotrema uniflorum *Hk.*, var. appendiculata *Thw. ms.* (sp.)
1 Id. var. dentatum *Thw. ms.* (sp.)
2 Id. var. coloratum *Thw. ms.*
3 Anaxagorea luzonensis *A. Gr.*
4 Shorea reticulata *Thw.*
5 Vateria nervosa *Thw. ms.*
6 Semecarpus Thwaitesii *Hk. f.*
7 Naias graminea *Del.*
8 Lastrea crenata *Bedd.*
9 Podochilus falcatus *Lindl.*, var. angustatus *Thw. ms.*
3890 Panicum cæsium *Nees* (non *W. & A.*)
1 Asplenium falcatum *Lam.*
2 Diplazium sylvaticum *Sw.*. var. dentatum *Thw. ms.*
3 Sonerila zeylanica *W. & A.*
4 Senecio corymbosus *Wall.*
5 Rhynchosia viscosa *DC.*
3896 Acrotrema uniflorum *Hk.*, var. minus.
7 Id., var. membranaceum *Thw. ms.* (sp.)
8 Id., var. villosulum *Thw. ms.*
9 Id , var. rugatum *Thw. ms.*
3900 Polypodium Thwaitesii *Bedd.*
1 Memecylon phyllanthifolium *Thw.*
2 Polypodium hirtellum *Bl.*
3 Lindsæa orbiculata *Bedd.*, var. schizophylla *Baker* (sp. sub. Davallia).
4 Angiopteris erecta *Hoffm.*
5 Acrotrema minus *Hk.*, var. rugatum *Thw. ms.* f. major villosa (sp.)
6 Elæocarpus amœnus *Thw.*, fructu minore.
7 Sonerila Wightiana *Arn.*
8 Osbeckia buxifolia *Arn.*, var. Beckettii *Thw.*
9 Hedyotis cinereo-viridis *Thw.*, var. fumata *Thw. ms.* and var. truncata *Trim. ms.*
3910 Lasianthus strigosus *Wight*, var. nitidus *Thw.*
1 Psychotria glandulifera *Thw.*
2 Isonandra Wightiana *A. DC.*, var. compta *Thw.*
3 Oberonia platycaulon *Wight.*
4 Calamus rivalis *Thw. ms.*
5 Eugenia cyclophylla *Thw.*
6 Polyalthia persicifolia *Bedd.*
7 Goniopteris prolifera *Presl.*
8 Symplocos hebantha *Thw.*
9 Justicia zeylanica *T. And.*, var. capitata *T. And.*
3920 Elatostema lineolatum *Wight*, var. petiolare *Thw. ms.*
1 Polypodium pilosiusculum *Hook.*
2 Tænitis blechnoides *Sw.*
3 (Paspalum conjugatum *Berg.*)
4 Pavetta hispidula *W. & A.*, var. (? hybr.) Zeylanica *Hk. f.*

3925 Calamus ovoideus *Thw. ms.*
6 Dendrobium albidulum *Thw. ms.*
7 Davallia bullata *Wall.*
8 Erigeron linifolius *Willd.*
9 Christisonia albida *Thw.*
3930 Mallotus nitidus *Müll. Arg.*
1 Cyperus diffusus *Vahl.*
2 Bridelia stipularis *Bl.*
3 Pellæa falcata *Fée.*
4 Gymnogramme leptophylla *Desv.*
5 Hedyotis Lessertiana *Arn.*, var. marginata *Thw. ms.* (sp.)
6 Rhynchospora ruppioides *Benth.*
7 Polystichum aristatum *Presl.*
8 Polystichum cornifolium *Presl.*
9 Saccharum procerum *Roxb.*
3940 Cyperus Neesii *Kunth.*
1 Ipomæa aquatica *Forsk.*, var.
2 Coleus Wightii *Benth.*
3 Fimbristylis æstivalis *Vahl.*
4 Eragrostis poæoides *Beauv.*
5 Pteris longipes *G. Don.*
6 Smithia sensitiva *Ait.*
7 Cyperus pygmæus *Rottb.*
8 Semecarpus lævigata *Thw.*
9 Begonia dipetala *Grah.*, var.
3950 Microstylis congesta *Rchb. f.*
1 Diplazium polyrhizon (*Baker*).
2 Begonia tenera *Dryand.*
3 Begonia Thwaitesii *Hook.*
4 Peperomia Wightiana *Miq.*
5 Sonerila robusta *Arn.*, var. glabricaulis *Thw.*
6 Arundinaria densifolia *Munro.*
7 Trichomanes exiguum *Baker.*
8 Eulophia, sp.
9 Apocopis Wightii *Nees*, var. Beckettii *Thw. ms.* (sp.)
3960 Utricularia stellaris *L.*
1 Dunbaria ferruginea *W. & A.*
2 Vitis repanda *W. & A.*
3 }
4 } Oplismenus compositus *R. & S.*
5 Dimeria pusilla *Rottb.*, var. pallida *Thw. ms.*
6 Cyperus tenuiflorus *Thw.*
7 Garnotia patula *Munro.*
8 Marsilea minuta *L.*, var.
9 Acrotrema Thwaitesii *Hk. f. & Th.*, var. stolonifera.
3970 Elatostema acuminatum *Wedd.*
1 (Coleus aromaticus *Benth.*)
2 Trichomanes Motleyi *Van den Bosch.*
3 Pleopeltis dilatata (*Wall*).
4 Selaginella brachystachya *Spring.*
5 Selaginella proniflora *Baker.*
3976 Panicum ciliare *Retz.*
7 Aneilema glaucum *Thw.*
8 }
9 } Selaginella proniflora *Baker.*
3980 Arisæma filicaudatum *N. E. Br.*
1 Cleistanthus pallidus *Mull. Arg.*, var. subglaucus *Thw. ms.* (sp.)
2 Cassytha capillaris *Meissn.*
3 Christisonia bicolor *Gardn.*, var. spectabilis *Thw. ms.* (sp.)
4 Hedyotis rhinophylla *Thw. ms.*
5 Lasianthus Gardneri *Hk. f.*
6 Doona oblonga *Thw. ms.*
7 Shorea stipularis *Thw.*, var. minor.
8 Pleopeltis lanceolata *Presl.*
9 Trichomanes Wallii *Thw. ms.*
3990 Diplazium Smithianum (*Baker.*)
1 Trichomanes parvulum *Poir.*
2 Pteris biaurita *L.*, var. argyræa *Thw. ms.*
3 Ophioglossum bulbosum *Mich.*
4 Pittosporum nilghirense *W. & A.?*
5 Canthium puberulum *Thw.*
6 Knoxia platycarpa *Arn.*, var. spicata *Thw. ms.*
7 Lasianthus Moonii *Wight*, var. subglabra *Thw. ms.*
8 Strobilanthes punctatus *Nees.*
9 Ocimum aristatum *Bl.*
4000 Cinnamomum zeylanicum *Breyn.*
1 Pouzolzia indica *Gaud.*, var. suffruticosa *Wright?*
2 Liparis brachyglottis *Rchb. f.*
3 Coelogyne, sp.[*]
4 Hymenophylla exsertum *Wall.*
5 Polypodium cornigerum *Baker.*
6 Alsodeia decora *Trim. ms.*
7 Lastrea sparsa *Moore*, var. zeylanica *Bedd.*
8 Shorea brevipetiolaris *Thw. ms.*
9 Thismia Gardneriana *Hk. f.*
4010 Shorea Dyerii *Thw. ms.*
1 Erythroxylum lucidum *Morn.*, var.
2 Sonerila Guneratnei *Trim. ms.*
3 Eugenia Neesiana *Wight.*
4 (Scoparia dulcis *L.*)
5 Phyllanthus (Reidia) hakgalensis (*Thw. ms.*)
6 Saccolabium ? sp.[†]
7 Eria, sp.
8 Cyperus puncticulatus *Vahl.*
9 Arundinella nervosa *Nees.*
4020 Panicum decompositum *Br.*
1 " Strobilanthes."[‡]
2 (Bambusa nana *Roxb.*)
3 Arundinaria floribunda *Thw.*
4 Shorea stipularis *Thw.* var. minor.

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[*] Of C. P. 4003 there is no specimen in Hb. Perad., only a drawing.

[†] It is doubtful whether these specimens, C. P. 4016, are wild Ceylon plants.

[‡] There is no specimen of C. P. 4021 in the Peradeniya Herbarium.

In addition to the plants in the above list, a considerable number of species has been recorded from Ceylon in various systematic treatises (and especially in the 'Flora of British India,' now in course of publication), which were not included in the 'Enumeratio.' Of these most were collected by Col. and Mrs. Walker, in the years 1830–1840, entirely in the south-western and southern parts of the Island, and have not been met with by subsequent collectors. Some of their gatherings were garden plants however. The collector was MacRae, who had charge of Peradeniya Gardens from 1827 to 1830; many of the plants sent home by him as natives of Ceylon were evidently gathered in the gardens, and are nowhere wild in the colony; whilst others are from N. W. India, where he also collected for the Horticultural Society. Some of Gardner's plants, collected by him in company with Wight in the Nilgiris in 1845, have also been erroneously given for Ceylon; and altogether there is a rather large number of names to be deleted in the list of recorded Ceylonese plants. A corrected and revised catalogue of the whole flora is now being printed at Colombo for the Asiatic Society's (Ceylon Branch) 'Proceedings,' in which I have taken care to distinguish all doubtful natives and erroneous records.

During the five years I have been in Ceylon, a good many species (chiefly Indian) have been detected, especially in the less-known portions of the Island, which have not, so far as I know, been previously recorded. The greater part of these have been met with in my own excursions through the country, but many have been detected by my friend Mr. W. Ferguson, F.L.S., of Colombo, an excellent field botanist, who during the long residence of 45 years in the Colony has lost no opportunity of acquiring and adding to his extensive acquaintance with its vegetation. Mr. H. Nevill, of the Ceylon Civil Service, has also availed himself of his residence and travels in unfrequented districts to collect rare plants, and has thus added several species to our flora.

The following is a list with notes of these additions. The few new or undescribed species it contains, as well as those mentioned by name in the above list, and a few others, will be described at the end of this paper.

ADDITIONS TO THE FLORA OF CEYLON.

Tinospora malabarica Miers (*Menispermum* Lam.). — I can scarcely consider this and *T. tomentosa* Miers (*Menispermum* Roxb.), to form distinct species, but regard them rather as varieties of one. Both are fairly common in the low country of S.W. Ceylon, and are not distinguished by the natives, who call them both "Pou-kinda," or "Wal-kinda." C. P. 2804 includes examples of both forms. In the 'Fl. Brit. Ind.' i., p. 96, neither are given for Ceylon, but in the 'Flora Indica' of 1855, p. 182, Hooker mentions a Ceylon example as probably referable to *T. malabarica*.

T. crispa Miers (*Menispermum* L.). — It is probable that this species, which has a great medicinal reputation as a bitter febrifuge among the Malays, has been by them introduced to Ceylon. It is known as "Titta-kinda," and occurs in an apparently wild condition. In the neighbourhood of Kadawalla, on the Kelani River, about ten miles from Colombo, this plant is a striking object, wreathing the stems of the Jak trees and Coco nuts with its rooted twining stems. In January it was without flowers or fruit. This is the *Funis pelleus* of Rumph, Herb. Amboin. v., p. 82, whose figure (t. 44, f. 1*) of the characteristic stem is very fair. Scheffer has figured as *T. crispa*, a plant with male flowers from the Buitenzorg Gardens (Obs. Bot. iii., p. 71, t. 1), which has a longer and more ovate leaf than the Ceylon plant. The localities for this species given in the Fl. Brit. India—Silhet and Assam to Pegu and Malacca—are in favour of its nativity in Ceylon also. It drops down very long thread-like roots from great heights, like *T. cordifolia.*

Cleome tenella L. f.—On the dry sandy coast at Puttalam and Chilaw, W. coast, Nov. 1881. A slender annual which quickly dries up and disappears. It occurs in similar places on the Carnatic; has been found in Nubia and Senegal, and doubtless occurs in the intermediate desert regions.

Cerastium glomeratum Thuill.—This familiar little plant is common about Nuwana Eliya, 6200 ft., and may be native, as appears to be considered the case in similar cases in India. Thwaites, however, thought it introduced with grass seed, like so many other European weeds in the mountains of Ceylon, and omitted it from the body of the 'Enumeratio.'

Calophyllum elatum Bedd.?—To this I refer, with some doubt, a tree of which the leaves were sent to me in 1882, from the Devilane Forest, near Batticalon, by Capt. Walker, Forester for the Eastern Province. It has been entered under this name, in Mr. Vincent's Report on the Forests of Ceylon (Part i., pars. 106 and 147), the native name being given as "Tombu-kata." We have the tree also in the gardens at Peradeniya, but I have not seen flowers or fruit. Beddome's species was first named in 'Trans. Linn. Soc.,' xxv. p. 212, and is described and figured in his 'Fl. Sylvatica,' t. 2, and his Forest Report for 1863–64. It yields the Von spars of commerce. In the 'Flora Brit. Ind.' it is regarded as a variety of *C. tomentosum* Wight, which is a very common species in the lower districts of Ceylon, and one of those called "Kina" by the Sinhalese. The leaves of the Batticalon tree are, however, very much longer and narrower, with a rounder base and more horizontal secondary nerves. It may be the *C. angustifolium* Roxb., from Penang, of which nothing seems to be known.

Vatica obscura Trim., n. sp.

Pavonia glechomifolia A. Rich.—This has been recorded for

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[*] Linnæus has quoted this figured correctly, but has caused confusion by accidentally giving the name as *Funis quadrangularis*, p. 83, which is fig. 2 on the same plate.

Ceylon, I know not on what authority, in 'Fl. Brit. India' i., p. 330. I have since found it plentifully about Tissa-maha-rama, an ancient place in the S. Province, formerly of great importance. The plant has a wide range through the drier parts of India, and extends to Arabia and Trop. Africa.

Triumfetta conspicua Trim., n. sp.

Grewia populifolia Vahl.—First sent to me by H. Nevill, Esq., C.C.S., in December 1881, from Puttalam, in fruit; and in that state not easily determinable. I have found it abundantly in the Hambantota district in the south-east of the Island, and it is doubtless frequent in the dry coast districts. This is a desert shrub, first gathered by Forskal in Arabia. When the fruit is symmetrically and completely developed, which is rarely the case, it consists of two separable portions, each of which is didymous, and contains two bony pyrenes; the pyrenes are again 2-celled, with a very thick and hard partition and a single seed in each cell. The fruit is thus normally 8-seeded.

Balsamodendron Berryi Arn.—Under the Tamil name of "Mulkilivai," this is a well-known hedge plant in the Jaffna district of the extreme north of the island, and is employed for the same purpose along the west coast of Ceylon as far south as Colombo, where alone I have seen it. Mr. W. Ferguson, F.L.S., to whom I am indebted for the above information, also tells me that it is obtained from wild plants in the islands of the Gulf of Mannas (belonging to Ceylon), especially from that one named Delft by the Dutch, and I regret that I have as yet had no opportunity of verifying the statement. In parts of Southern India, however, I observed *B. Berryi* in vast abundance; it is used for miles in fencing the railway line about Erode, &c., and attains fully 10 ft. in height. I did not see any, however, that looked wild. At Trichinopoly I succeeded in getting some specimens, and Major Johnson, of Mettapollium, has since sent better ones from Coimbatore. The Indian plant is very spiny, with thick, horizontally divaricate interlaced branchlets (making an almost impervious hedge), small rigid 3-foliate leaves with sessile obovate leaflets,—the terminal are much the largest,—and little clusters of 2–5 sessile flowers. As noticed in 'Medicinal Plants,' sub t. 59, this plant must be very closely allied to, if not identical with, *B. Myrrha* Nees, figured at t. 60 of the same book, but if it afford any gum-resin in S. India it is of a character very different from myrrh.*

As cultivated in Colombo, &c., the plant takes on a very different appearance; the spines are more slender and much less numerous, the leaves much larger, usually pinnately 5- or 7-foliolate with serrate leaflets, and the infloresence large and compound, in divaricate cymes. So unlike is this slender-growing leafy shrub to any *Balsamodendron* (except some forms of *B. africanum*) that I was long in doubt as to its identity, and inclined to refer it to some *Protium*. Prof. Oliver, however, to whom I submitted specimens, was of opinion that the plant was probably merely a luxuriant state of *B. Berryi*, and I believe him to be perfectly correct, the wet climate of Colombo accounting for the change.

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* Beddome, who gives a poor figure (Fl. Sylv. t. 126) of *B. Berryi*, says that it forms a good-sized tree in the dry jungles to the east of the Nilgiris, and that a gum resin exudes from it. He also notes that the flowers are frequently destroyed when young by some insect. I find them generally malformed from this cause in Ceylon.

Protium should be combined with *Balsamodendron*, as is done by Wight, Marchand, Baillon and Engler, under various names. Both genera possess the peculiar lobed arilloid investment of the pyrene ("mesocarp' in Med. Plants, t. 59); in *B. caudatum* March. (*Protium* W. & A.) this is very conspicuous, being bright salmon-red.

Vitis tomentosa Heyne.—Found in the forest near Anuradhapura, the ancient capital of Ceylon, Oct. 1883. A rather handsome species, with large masses of dark vinous-red crowded flowers and floccose wide-climbing stems; justice is scarcely done it in Wight, Illust. t. 57. On the mainland it is confined to the south parts of the peninsula.

Cardiospermum canescens Wall.—This pretty climber is abundant and ornamental in the country round about Hambantota, covering the scrub with its delicate foliage and milk-white blossoms. In full flower in December. The pubescence is very minute, and barely justifies the specific name. The species is found in the south of peninsular India, also in Burmah and Abyssinia.

Rhynchosia densiflora DC.—Near Tissa-maha-rama S. Province, sparingly, Dec. 1882. A South Indian species, which has also occurred in E. Trop. Africa.

Bauhinia Anguina Roxb. (*B. scandens* L., pro max. parte, non Roxb.).—There is some doubt whether this great climber can be considered other than as an introduction. I found several large masses of it at the foot of Doluwa Kande, a hill about eight miles north of Kurunegala, and it has been reported from one or two other spots; but it has not been found in flower. A very large specimen in the Peradeniya Gardens has long been an object of curiosity and interest, but this also has never flowered. The figures in the 'Hort. Malabaricus,' viii., tt. 29–31, are sufficiently characteristic of the "chain-cable"-like stems; the young trailing shoots run extensively over the ground and root at the joints; the plant is thus easily propagated either accidentally or by intention.

Acacia planifrons W. & A.—Good specimens of this characteristic species were sent to me in October, 1882, from the Island of Mannar, one of the most arid tracts in the colony. It appears to be so abundant there as to be largely cut for firewood, and even exported to India (see Vincent's 'Report on Ceylon Forests,' pars. 98 & 121). The Tamil name is "Odai," and the pods are said to be a good cattle-food. I was greatly struck with the cedar-like growth of this acacia in S. India (as seen from the railway), on the low rocky hills near Ayyalur Station, between Trichinopoly and Madura; it is well called "Umbrella Tree" by the English. It is also frequent at Tuticorin, and plants have occasionally sprung up on the shore at Colombo from seeds brought no doubt with ballast from that neighbouring port. Roxburgh's unsatisfactory figure of

Mimosa eburnea ('Pl. Coromandel,' t. 199) is quoted for this by Baker in 'Fl. Brit. Ind.' ii., p. 293, but Bentham has pointed out (Trans. Linn. Soc. xxx., p. 512) that it represents a young shoot of *A. eburnea*. The flowers of *A. planifrons* are not yellow, as given in 'Fl. Brit. Ind.,' but pale creamy-white; nor are the pods straight in *A. eburnea*, but nearly as much curved as in *A. planifrons*, only flat instead of turgid, as in the latter species. The expressive name *planifrons* was given by Koenig (sub *Mimosa*).

A. ferruginea DC. (*Mimosa* Roxb.).—A few trees only at Anemaduwe, between Puttalam and Kurunegala, in the North-west Province. Evidently a rare species in Ceylon, as also, I believe, in India, where the localities given are Courtallum and the Circars.

Eugenia Hæckeliana Trim., n. sp.

E. phillyræoides Trim., n. sp.

(To be continued.)

A CONTRIBUTION TOWARDS A FLORA OF BRECONSHIRE.

By W. Bowles Barrett, F.L.S.

(Concluded from p. 112.)

**Epipactis latifolia* Auct. F. in woods and bushy places. Dolygaer. Llanthetty. Talyllyn. Builth. I was too late for the other orchids.

**Iris Pseudacorus* L. Near Brecon; *Miss Fryer*. I believe not common. Llangorse. — *I. fœtidissima* L. Not seen.

**Narcissus Pseudo-narcissus* L. Fields at Ffrwdgrech, near Brecon, probably native; *Miss Fryer*. (Possibly *lobularis*; see Journ. Bot. 1884, 194.)

Tamus communis L. C.

Convallaria majalis L. Lime rocks, Pen-y-wyllt; *A. Ley*.

Scilla nutans Sm. C.

Allium Schænoprasum L. *Matth. Moggridge*. Top. Bot. ed. ii. — *A. ursinum* L. Craig Rhiwarth. Pen-y-wyllt; *A. Ley*. Vennyfach rocks; *Miss Fryer*.

Narthecium Ossifragum Huds. Nant-gwyllt. Absent, so far as I know, from the Brecon Black Mountain District; *A. Ley*. Scarce. In peaty bogs, Pen-y-wyllt.

Luzula pilosa Willd. Near Brecon; *Miss Fryer*. Shady lane near Ffrwdgrech Waterfall. — *L. campestris* DC. F. *A. Ley*. — *L. sylvatica* Bicken. Capel Coelbren; *A. Ley*. Vennyfach Rocks; *Miss Fryer*. Rocky glens, Pen-y-wyllt. Rocky bank of Usk, between Brecon and Dinas. — *L. multiflora* Koch. Craig-y-Gledsiau, Brecon Beacons; *A. Ley*. Bog near Rhymney Bridge Station. — Var. b. *congesta*. C.

Juncus conglomeratus L. Very common. — *J. effusus* L. Lower Elan Valley; *A. Ley*. — *J. glaucus* Sibth. Near Capel Coelbren;

A. Ley. Gilwern. I have no other record for this rush, so common in South and Mid England. It has not yet been recorded for the neighbouring counties of Cardigan, Montgomery or Merioneth, but Mr. Ridley informs me that it is the commonest *Juncus* in portions of Herefordshire, on the old red sandstone.—*J. acutiflorus* Ehrh. C. — *J. lamprocarpus* Ehrh. F. — *J. supinus* Mœnch. C. — *J. bufonius* L. Very common. —*J. obtusiflorus* Ehrh. Not seen. — *J. eu-compressus* Jacq. (Mature capsule bluntly obovate, longer than perianth segments); in the dry bed of the Usk, above Brecon; *A. Ley.* — *J. squarrosus* L. Very common. Widely distributed.

Rhynchospora, none seen. In Top. Bot. ed. ii., *R. fusca* is queried as an error.

Scirpus acicularis L. Rare. One large patch observed on east side of Llangorse Lake. — *S. palustris* L. On the Wye, Glasbury; *A. Ley.* Llangorse Lake. I have no other record. — *S. pauciflorus* Lightf. Wet and stony places on moor, Pen-y-wyllt. Rare in Mid Wales. — **S. cæspitosus* L. Abundant on mountains. — **S. setaceus* L. F. Pen-y-wyllt. Mountain above Torpantau Station, about 1700 feet. Near Llangastey. Talyllyn. Brecon. Builth. *S. Tabernæmontani* Gmel. Llangorse Lake, abundant. Very rare in inland Wales.— *S. multicaulis* Sm., *S. fluitans* L., and *S. lacustris* L. Not seen.

Eriophorum vaginatum L. Top. Bot. ed. ii. Brecon Beacon Moors; *A. Ley.* — *E. angustifolium* Roth. C. in mountain bogs. Noted at Pen-y-wyllt, on Epynt Hills, &c. I found an interesting plant, with downy peduncles, in a mountain bog, about 500 feet above and on the west side of Torpantau Railway-station. Mr. J. G. Baker, to whom I submitted this plant, remarks that it has the peduncles and fruit, but not the leaves of *E. gracile* Koch. Unfortunately my specimens were imperfect. The plant should be further searched for.

Carex dioica L. Moorland, Brecon Beacons; *A. Ley.* — *C. pulicaris* L. Honddu Valley; *A. Ley.* Mountain above Torpantau Station, plentifully.—**C. disticha* Huds. Llangorse Lake. Apparently scarce in Wales. — **C. paniculata* L. Mountain bog above Torpantau Station, about 1700 ft.—*C. muricata* L. Honddu Valley; *A. Ley.* Near Brecon.—**C. divulsa* Good. In a sheltered shady lane, Llangorse. Only recorded with certainty from two other Welsh counties, but doubtless overlooked. — *C. stellulata* Good. Honddu Valley; *A. Ley.* C. Pen-y-wyllt. Near Rhymney Bridge Station. Torpantau. Builth.—*C. remota* L. Pen-y-wyllt; *A. Ley.* Probably frequent. Banks of the Usk, Talybont. Above Ffrwdgrech Waterfall, near Brecon.—*C. ovalis* Good. Near Doldowlod; *A. Ley.* Pentwyn near Dolygaer. — Var. *b. *bracteata* Syme. Dolygaer Reservoir. — *C. vulgaris* Fries. Cwm Tarell and Capel Coelbren; *A. Ley.* Pen-y-wyllt. Llangastey. By Llangorse Lake (with three male spikes).—*C. glauca* Scop. C. — *C. montana* L. On limestone, Craig-y-Rhiwarth near Pen-y-wyllt; *A. Ley.* — *C. pilulifera* L. Honddu Valley; *A. Ley.* — *C. præcox* Jacq. Cwm Tarell; *A. Ley.* — *C. pallescens* L. Talybont. Llangorse Lake. — *C. panicea* L. Near Capel Coelbren ; . *Ley.*

F. Pen-y-wyllt. Torpantau. Near Llangastey. Epynt Hills.—*C. sylvatica* Huds. Near Builth; *A. Ley.*—*C. lævigata* Sm. Cwm Tarell; *A. Ley.*—*C. binervis* Sm. Pen-y-wyllt. Mountain, Pentwyn. Builth.—*C. fulva* Good. Near Capel Coelbren; *A. Ley.* Pentwyn. Mountain, Torpantau. Epynt Hills near Garth.—**C. eu-flava* L. Shore of Llangorse Lake, east side, about one mile from north-west end of Lake. Confirmed by Mr. J. G. Baker.—Var. b. *lepidocarpa.* Widely distributed: this, with *C. stellulata* Good., is one of the commonest sedges of the wet moorlands.—*C. hirta* L. Near Penderyn; *A. Ley.* Talybont. Llangastey (leaves and sheaths nearly glabrous). Apparently scarce in Wales, but perhaps overlooked.—**C. paludosa* Good. Llangorse Lake. Only certainly recorded from two other counties in South Wales.—*C. ampullacea* Good. Blaen Taf-vechan; *A. Ley.* Llangorse Lake, abundant.—**C. vesicaria* L. Bog, Pen-y-wyllt.—*C. pendula* Huds. and *C. riparia* Curt., not seen.

Anthoxanthum odoratum L. C.

Digraphis arundinacea Trin. Elan and Honddu Valleys; *A. Ley.* Common by streams at Llangorse, Brecon, Hay, Builth.

Alopecurus geniculatus L., F.; *A. agrestis* L. and *A. pratensis* L., not seen.

Phleum pratense L. C.

**Agrostis canina* L. Moor near Rhymney Bridge Station—*A. alba* L. Top. Bot. ed. ii. In the dry bed of the Usk, above Brecon; *A. Ley.*—*A. vulgaris* With. C.

**Phragmites communis* Trin. Rare. Llangorse Lake.

Milium effusum L. Not seen.

Aira cæspitosa L. C.—*A. flexuosa* L. Nant-gwyllt; *A. Ley.* Mountain, Pentwyn.—**A. caryophyllea* L. F. Torpantau. Garth.—*A. præcox* L. Cwm Tarell; *A. Ley.* Brynmawr. Garth. Builth.

Avena flavescens L., and *A. elatior* L. C. No other *Avena* seen.

Holcus mollis L. C. Widely distributed.—*H. lanatus* L. C.

Triodia decumbens Beauv. Cwm Tarell; *A. Ley.* Mountain, Pentwyn. Garth.

Molinia cærulea Mœnch. C.

Melica nutans L. Limestone wood, Craig-y-Rhiwarth near Pen-y-wyllt; *A. Ley.*—*M. uniflora* Retz. Near Brecon, frequent. Wooded bank of Wye Hay.

Catabrosa aquatica Beauv. Not seen.

Glyceria fluitans Brown. C.* Var. b. *pedicellata.* Llangastey, near Llangorse Lake.—*G. plicata* Fries. Cwm Tarell; *A. Ley.* Near Hay. Flintshire is the only other Welsh record as yet.—*G. aquatica* Sm., and *Sclerochloa rigida* Link., not seen.

Poa annua L., *P. pratensis* L., and *P. trivialis* L. C.—*P. nemoralis* L. Taren r' Esgob Black Mountain, with *Hieracium prenanthoides*; near Brecon; *A. Ley.*

Briza media L. F. Llangastey, &c.

Cynosurus cristatus L., and *Dactylis glomerata* L. C.

Festuca sciuroides Roth. Near Builth; *A. Ley.*—*F. ovina* L. Very common.—*F. rubra* L. var. a. *duriuscula.* Partricio; *A. Ley.*—

F. elatior L. By the Usk, above Brecon; *A. Ley.* Not seen by me. — *F. pratensis* Huds. Meadow near Llangorse.

Bromus giganteus L. Near Newbridge; *A. Ley.* C. Noted at Gilwern, Talybont, Brecon, Hay. — *B. asper* Murr., var. a. *serotinus.* Noted with the last. — *B. sterilis* L. Uncommon. Only seen at Gilwern and Builth. — *B. mollis*, *secalinus*, *racemosus* and *commutatus* not seen.

Brachypodium sylvaticum R. & S. C. Widely distributed. A form at Cathedine, near Llangorse, with the spikelets curved outwards, as in *B. corniculatus* Lam. — *B. pinnatum* Beauv. (not yet recorded for Wales), not seen.

Triticum caninum Huds. Near Brecon; *A. Ley.* Rare. Shady banks above Ffrwdgrech Waterfall, near Brecon, sparingly. A rare grass in Mid-Wales. — *T. repens* L. Nant-gwyllt; *A. Ley.* F. Pen-y-wyllt. Three Cocks Junction. Far less frequent than in South-West England.

Lolium perenne L. C. *A. Ley.* — **L. italicum* Braun. Llangorse. Introduced. I searched for, but failed to find any *Hordeum* in the county. The Rev. A. Ley does not remember seeing any.

Nardus stricta L. F. on the Black Mountain ranges; *A. Ley.*

Hymenophyllum Wilsoni Hook. Sparingly among wet mossy turf on mountain rocks at Taren r' Esgob; Glen near the Brecon Beacons; *A. Ley.*

Pteris aquilina L. Very common.

Cryptogramme crispa Br. Near Brecon; *Miss Fryer.*

Lomaria spicant Desv. Lower Elan Valley; *A. Ley.* Not uncommon, but generally in small quantity. Pen-y-wyllt. Near Rhymney Bridge Station. Builth.

Asplenium Ruta-muraria L. Very common generally. — *A. Trichomanes* L. Very common. — *A. viride* Huds. Craig-y-Gledsiau, and on the northern precipice of Brecon Beacons; on Taren r' Esgob Black Mountain District, fine and abundant; *A. Ley.* Old walls and limestone rocks, Pen-y-wyllt, in some plenty. Not yet recorded from any other South or Mid-Wales county, except Glamorgan. — *A. Adiantum-nigrum* L. F. Pen-y-wyllt. Gilwern.

Athyrium Filix-fœmina Bernh. Very common; widely distributed. — Var. *convexum.* Glasbury; *A. Ley.*

**Ceterach officinarum* Willd. C. Gilwern. About Talybont abundant. Llangorse. Brecon, abundant. Builth, sparingly.

Scolopendrium vulgare Sm. Near Penderyn; *A. Ley.* F. Pen-y-wyllt. Gilwern. Brecon. Hay. Much less common than in South-West England.

Cystopteris fragilis Bernh., var. b. *dentata.* The Grwyne Valley Black Mountain District; *A. Ley.* Old walls and limestone rocks, Pen-y-wyllt.

Aspidium aculeatum Sw. Near Builth; *A. Ley.* Scarce. Glen at Ffrwdgrech Waterfall. Wood, Alltmawr near Builth, sparingly. — *A. angulare* Willd. Near Builth; *A. Ley.* Scarce; not seen by me.

Nephrodium Filix-mas Rich. Very common. — Var. *affine.*

Old lanes between Three Cocks and the Black Mountain; *A. Ley.* — Var. *Borreri.* Very abundant and well marked on the Black Mountain; *A. Ley.*—*N. dilatatum* Desv. With almost concolorous scales, near Nantgwyllt; *A. Ley.* F. — *N. Oreopteris* Desv. Elan Valley, lower part, near Nant-gwyllt; *A. Ley.*

Polypodium vulgare L. F.; but apparently not common in South Breconshire. — *P. Phegopteris* L. Glen by the waterfall, Coel Bren, fine; mountain sides in the Honddu Valley, small; *A. Ley.* Slwch Lane, near Brecon; *Miss Fryer.* By a mountain stream, Pen-y-wyllt. — *P. Dryopteris* L. With the last in the Honddu Valley, and I believe at Coel Bren; *A. Ley.* Slwch Lane, near Brecon; *Miss Fryer.* Vale above Rhymney Bridge Station, sparingly. — *P. Robertianum* Hoffm. Among loose stones at base of the Tarens in Honddu Valley, *e. g.*, at Taren r' Esgob; *A. Ley.*

Osmunda regalis L. *E. H. Jones*, Top. Bot. ed. ii. Not seen by Rev. A. Ley or myself.

Botrychium Lunaria Sw., Erwood; *A. Ley.*

Lycopodium alpinum L. A single small patch on the north face of the Black Mountain, six miles south of Hay; *A. Ley.* — *L. Selago* L. Taren r' Esgob Black Mountain, in small quantity; *A. Ley.*

Equisetum arvense L. C. — **E. maximum* Lam. Abundant in a swamp above Ffrwdgrech Waterfall. Evidently rare in Mid-Wales, and not yet recorded from neighbouring counties of Radnor and Montgomery. — *E. sylvaticum* L. Near Nant-gwyllt; *A. Ley.* Rare. Swampy mountain side near Pen-y-wyllt Station. — *E. palustre* L. C. — **E. limosum* L. Llangorse Lake, abundant.

THE IDENTITY OF *BACTERIUM FŒTIDUM* THIN WITH SOIL COCCI.

By Spencer Le M. Moore, F.L.S.

In the Royal Society's 'Proceedings' (xxx. 473), Dr. Thin described the organism found in association with profuse sweating of the soles of the feet to which he gave the name of *Bacterium fœtidum.* In the moisture which exudes from the soles, and which, on account of its alkaline reaction compared with the acidity of perspiration obtained at the same time from the general surface of the body, Dr. Thin considers to be not pure sweat, but a mixture of sweat and serous exudation from the blood, *Bacterium fœtidum* is capable of rapid growth, the form assumed being that of spherical cocci refracting light brightly and uniformly. Cultivated in sterilised vitreous humour, the cocci were found to develop into a series of forms, commencing with wedge- and canoe-shaped bodies containing each a bright coccus; thence into short rods bearing a coccus or cocci at the ends or centre: these rods either became fragmented, the fragments clinging together in clusters, or they assumed ordinary *Bacterium* and *Bacillus* form and spored, the spores being in all respects identical with the cocci found upon the feet.

While examining the coccus form of *Bacterium fœtidum* and the cocci of surface soil ("corpuscules brillants" of Pasteur), I was struck by the great similarity between them, and determined to ascertain whether the identity were real or merely apparent. That there is a real identity the following experiments tend to show.

Morphological proof of the identity of Bacterium fœtidum Thin *with soil-cocci.*

The method adopted was to cultivate, in imitation of Dr. Thin, ferment from soil lying immediately beneath the surface, and the *Bacterium* (obtained by scraping fetid socks after a short soaking in distilled water), in test-glasses containing vitreous humour. As in Dr. Thin's experiments, the test-glasses, provided with glass caps and covered by a larger glass, were purified by exposure to a temperature above 300° Fahr. for two hours; the vitreous humour, forced through fine muslin, was sterilised by introducing it with care into carbolised cotton-wool plugged test-tubes previously purified similarly to the glasses, and then kept in boiling water for half an hour. The soil, freed as far as possible from traces of organic matter, was sifted through fine muslin before being placed in a test-glass.* Dr. Thin satisfied himself that his fluids were sterilised by the above treatment, and one of my fluids examined after a fortnight showed no trace of organisms. I, however, made some additional experiments, with the same results as were obtained with fluids treated according to Thin's method—with fluids sterilised in test tubes provided with firmly secured corks previously soaked in creosote and turpentine, and kept in boiling water for several hours on three successive days. A test-fluid so treated remained clear for upwards of two months, and showed no trace of organisms when examined.

After cultivating for two or three days in a warm chamber kept, by means of a Page's apparatus, at 96°–99° Fahr., the surface of the liquid in which the *Bacterium fœtidum* was growing, as well as of that charged with soil, was covered with a firm resistant scum. In the scum of the latter, and in the liquid below it, were found the series of forms now to be described.

At the first stage bright cocci are seen contained each in a darker wedge- or canoe-shaped envelope; their position in the canoe is almost always a little to one side of the centre, in the wedge at the wider end. The wedge or canoe may end either sharply or bluntly. Sometimes two cocci are found in association in a double semicanoe-shaped envelope, similar to those shown at fig. 3*a* of Dr. Thin's memoir; but two cocci, oscillating within a single canoe (seen once by Thin) were never found in any of the cultures. There can be no doubt that these cocci, similar in size and appearance to the "corpuscules brillants," are identical with them; their average diameter is 1·35 μ.

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* The vitreous humour, the soil and the *Bacterium* were introduced into the purified test-glasses, uncovered, when held far back over an open fire and as near to the fire as possible. The test-tubes were similarly opened to receive the vitreous humour. This method I consider as good as, perhaps preferable to, the carbolic-spray method. The cotton-wool plugs were about 1½ inch in length.

In the next stage a short staff-like rod, 5.0—6·0 μ in length and 1·0 μ in width, has appeared in the canoe, and standing out from it at its centre or end and distinguished by its greater brilliancy is the coccus. In early stages of rod-formation the boundaries of the canoe-shaped envelope can still be traced, but they soon disappear. Sometimes more cocci are associated with each rod; they are then usually placed either singly at its ends or paired at its centre. The cocci can be traced gradually dwindling away, and finally merging with the substance of the rods.

By simple elongation the *Bacterium* next reaches its *Bacillus* stage. The *Bacilli* are of varying length—on an average about 25·0 μ, but this size is often greatly surpassed, some of them measuring as much as 144·0 μ. Already in cultures only three days old their protoplasm is, in some cases, divided into a row of spores reaching from end to end of the cell. These spores—in every way resembling the "corpuscules brillants"—are discharged in great numbers by the collapse of their investing sheaths.

The other method of the rods' growth described by Dr. Thin, *viz.*, their fragmentation to form small clusters, was also observed by me, but not frequently.

A series of figures illustrative of the chief forms assumed by the soil-ferment in its development were drawn with the camera for comparison with the figures on Dr. Thin's plate. The resemblance in every way between the two series was most striking This plate having unfortunately been lost, it would not be possible to replace it without repeating the cultures, for which I have no present opportunity.

It is necessary to say here that I in no way assert soil-cocci to be referable to *Bacterium fœtidum*, for I quite agree with the remark of a great physiologist, that my results would equally prove the non-specificity of Dr. Thin's organism as the specificity of the cocci.

The cocci obtained by scraping fetid socks developed the same series of forms as did the soil-ferment, thus proving that I really had Dr. Thin's organism to work with—a very important matter, as the immediate sequel will show.

Chemical proof of the identity of Bacterium fœtidum Thin *with the cocci of the soil.*

This part of the method consisted in testing the chemical deportment of soil-ferment, and of the *Bacterium*, when cultivated in various fluids, in the warm chamber at approximately the same range of temperature as above mentioned. The identity is shown in three ways—

(i) *Both are capable of reducing nitrates to nitrites.*—Into a test-glass containing soil-ferment growing in sterilised vitreous humour was introduced, under suitable precautions, a small quantity of a 20 per cent. solution of potassium nitrate. After six days' interval the liquid was tested for nitrite, into which it was found that part of the nitrate had been converted. *Bacterium fœtidum*, similarly treated, yielded the same result, but the amount of nitrite liberated seems to be less than in the former case, a few minutes elapsing before the starch iodide was fully formed.*

(ii) *Both reduce sulphates to sulphites, and phosphates to phosphites.*—Small quantities of a 20 per cent. solution of magnesium sulphate were introduced into two test-glasses containing sterilised vitreous humour, charged in one case with soil-ferment, in the other with the *Bacterium*. It was ascertained that part of the sulphate in either was reduced to sulphite after the lapse of three days.

Some Pasteur's fluid was prepared without sugar; after growing in it both soil-ferment and the *Bacterium* for a few days, part of the sulphate (magnesium) in either was found reduced to sulphite, and of the phosphates (calcium and potassium) to phosphites.

Into some filtered perspiration were placed soil and four drops of a 10 per cent. solution of magnesium sulphate. Part of the sulphate was soon converted into sulphite. Sulphated perspiration charged with the *Bacterium* likewise gave the test for sulphite.

(iii) *Both liberate large quantities of ammonia from the fluids in which they grow.*—This was proved by many experiments with sterilised vitreous humour, and also with perspiration. In all cases a copious precipitate was obtained with Nessler's test, after a few days' growth of soil-ferment and the *Bacterium* in the fluids. Comparison of these charged fluids with uncharged test-fluids similarly treated, showed that all or by far the greater part of the ammonia was disengaged by the growth of the soil-ferment and *Bacterium*, and that none resulted from manipulation.

In all cultures of perspiration the initial acidity gave place to alkalinity, due doubtless to formation of ammonia in them.

General Considerations.

According to the doctrine here advanced, access of the ferment to the sole of the foot must take place by the penetration of fine dust containing ferment through the seams of boots. That this does occur is beyond a doubt; for not only is the ferment of universal occurrence in surface soil derived from deposits belonging to all the great geological horizons, but cocci are always to be found upon the feet, even under the most cleanly conditions.

Whether the ferment has any relation of causation to an abnormal escape of fluid from the soles is a very obscure problem. In the case of people who perspire copiously, the ferment, silting through the boots and not assiduously removed, would find itself bathed by a fluid in which it could freely grow. We have seen that one result of its growth is the liberation of ammonia in considerable quantities. But the alkaline reaction of the fluid, being doubtless due to the presence of this ammonia, is no evidence to the fluid's consisting of serous exudation from the blood as well as of sweat; it may, and perhaps does, consist of perspiration alone. It is, moreover, uncertain whether there is any increase in the amount of fluid escaping from the soles of persons suffering from the disease; and if there is, whether such increase may not be due to warm weather. It is perhaps not impossible, however, that the ferment may be the direct cause of an increase of the fluid, the immediate agent being the ammonia liberated by the ferment's growth and absorbed into the tissues of the soles.

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* Starch and potassium iodide exposed in the room in which the experiment was performed showed not the least trace of blueing until after the lapse of some time.

Another matter worthy of note is the greater chemical energy of the soil-ferment as compared with that of the *Bacterium*. This has already been mentioned in speaking of the reduction of nitrates, and it was observed in varying degree throughout the experiments. The reason is, I believe, that the supply of soil-cocci to the test-glasses was more lavish than of the *Bacterium*, on account of the greater difficulty of collecting the latter by the method adopted, and this rule was borne out by inspection of cultures in their early stages. Dr. Thin failed to find upon the fetid socks anything but cocci. This would seem to show that in perspiration (possibly in a mixture of perspiration and serum) the history of the *Bacterium* is simply a multiplication of cocci. On account of the difficulties in the way of obtaining perspiration in sufficient quantity to allow of sterilisation, I have not determined whether this is the case. For the same reason the experiment with perspiration is to be considered as inferential merely.

A NEW GENUS OF *MYRTACEÆ.*

By the Rev. B. Scortechini, F.L.S.

Pseudoeugenia, n. g.—Calycis tubus turbinatus, ultra ovarium productus annulo staminifero haud crasso donatus, limbi segmentis 4, parvulis, rotundatis. Petala 4, orbicularia unguiculata. Stamina 8, ordinate inserta, 4 oppositipetala, 4 oppositisepala filamentis brevibus deorsim expansis, in alabastro inflexis, antheris bilocularibus, loculis parvis apice filamenti more versatibilium insidentibus. Glandulæ nullæ. Ovarium 2-loculare; stylis brevis; ovual placentis e septo prominentibus 2–3 seriatim disposita, quaque serie 4–5 Fructus *Eugeniæ*, semina 1-2. Embryo . . . Arbor, foliis oppositis punctatis, inflorescentia axillaria, bracteis parvis.

Genus inter *Myrrhinum* ac *Eugeniam* locandum, gradu *Eugeniæ* propior accedit quam *Myrrhino*, quamquam cum *Myrrhino* communem habeat staminarum numerum. Habitu *Eugeniæ*, eam fallaciter imitatur. Nisi staminarum numerum attenderes, *Eugeniam* diceres. Verum propter stamina constanta linitata sub Eugenia recipi nequit.

Pseudoeugenia perakiana, mihi.—Arbor 30–40 pedalis, quosque sua parte glaber, foliis ellipticis 3–4″ longis, 1–1½″ latis, supra viridibus, subtus pallentibus, nervis fere horizontalibus, parce petiolatis: inflorescentia brevissime paniculata, trichotoma axillari; floribus $\frac{1}{4}''$ haud superantibus, petalis minimis orbiculatis; drupis $\frac{1}{3}''$ rubris, turbinatis medio parce constrictis.

Apud flumen Larut juxta originem in ditione Perak Peninsulæ Malayanæ.

A SYNOPSIS OF THE GENUS *SELAGINELLA.*

By J. G. Baker, F.R.S., &c.

(Continued from p. 122.)

Subgenus IV.—Heterostachys.

Group I.—Bisulcatæ.

253. **S. Burbidgei,** n. sp. — Stems slender, trailing, stramineous, intermatted, angled on the face, copiously pinnate, the distant erecto-patent branches sparingly compound. Leaves of the lower plane spaced even on the branches, rather ascending on the branches, spreading on the main stem, broad cordate-ovate, subacute, bright green, rather firm in texture, $\frac{3}{4}$–1 lin. long, cordate, strongly ciliated, and much imbricated over the stem on the upper side at the base; leaves of the upper plane half as long, cordate-ovate, with a short cusp. Spikes resupinate, $\frac{1}{4}$–$\frac{1}{2}$ in. long, 1 lin. diam.; bracts of the upper plane nearly patent, oblique lanceolate, acute; those of the lower plane very different, ovate-lanceolate, with a long cusp, ascending, strongly keeled, and strongly ciliated.

Hab. Landakan, Borneo, *Burbidge*! A very well-marked species.

254. **S. Beccariana,** n. sp.—Stems slender, trailing, $\frac{1}{2}$ ft. long, forked and copiously pinnate, rounded on the back, sulcate upwards on the face. Leaves of the lower plane spaced on the main stem, rather ascending, oblique ovate, acute, $\frac{1}{8}$–$\frac{1}{6}$ in. long, dark green, moderately firm in texture, much more produced on the upper side of the midrib, broadly rounded, shortly ciliated, and a little imbricated over the stem on the upper side at the base; leaves of the upper plane very small, ovate or ovate-lanceolate, acute. Spikes resupinate, $\frac{1}{4}$–$\frac{1}{2}$ in. long, 1 lin. diam.; bracts of the upper plane crowded, ovate-navicular, dark green, erecto-patent; of the lower plane smaller, ascending, broad ovate-cuspidate, strongly keeled.

Hab. Mt. Singalan, West Sumatra, 5000–6000 ft., *Beccari*! Habit and branching of the small forms of *radicata*.

255. S. bisulcata Spring Mon. ii. 259.—Stems slender, trailing, except towards the tip, a foot long, flat or bisulcate down the face, copiously pinnate, the branches short, deltoid and flabellately compound. Leaves of the lower plane contiguous on the branchlets, spaced on the main stem, spreading, the lower slightly squarrose, oblong-rhomboid, subacute, $\frac{1}{8}$–$\frac{1}{6}$ in. long, bright green, moderately firm in texture, rounded and slightly ciliated on the upper side at the base, hardly at all imbricated over the stem; leaves of the upper plane half as long, obovate or oblong, with a large cusp.

Spikes short, resupinate, ⅙ in. diam.; bracts very dimorphous, those of the upper plane lanceolate-rhomboid, the lower ones patent; those of the lower plane suborbicular, with a large strongly-keeled cusp.

Hab. Himalayas of Nepaul and Assam.

256. S. GORVALENSIS Spring Mon. ii. 256. — Stems slender, trailing, above a foot long, with root-fibres extending to the top, dichotomously forked at the base and upwards, distantly bipinnate, with short ascending slightly compound branches. Leaves of the lower plane slightly spaced except on the branchlets, ascending, ovate-oblong, subobtuse, ⅛–⅙ in. long, dark green, firm in texture, very unequal-sided, very cordate, and much imbricated over the stem on the upper side at the base; leaves of the upper plane half as long, ovate-cuspidate. Spikes short, resupinate, 1 lin. diam.; bracts obscurely dimorphic, those of the upper plane ovate-lanceolate, rigidly erecto-patent; of the lower plane rather shorter, paler, more ventricose, and more ascending.

Hab. Himalayas; Gurwhal, *Griffith*!

Group II.—PRONIFLORÆ.

257. S. INTERTEXTA Spring Mon. ii. 237. — Stems very slender, trailing, intermatted, 1–2 in. long, pinnate, the branches erecto-patent, the lower slightly compound. Leaves of the lower plane spaced on the main stem, erecto-patent, suborbicular, subobtuse, ⅓ lin. long, convex on the face, firmer in texture than in *S. integerrima*, nearly equal-sided, broadly rounded and strongly ciliated on the upper side at the base, and a little imbricated over the stem; leaves of the upper plane not much smaller, oblique ovate, cuspidate. Spikes very short, resupinate, ½ lin. diam.; bracts of the upper plane ovate, acute, erecto-patent; of the lower plane ovate, erect.

Hab. Philippines, *Cuming* 2015! A very distinct species.

258. **S. xipholepis**, n. sp.—Stems slender, decumbent, 2–3 in. long, sometimes forked at the base, the distant erecto-patent branches simple or little compound. Leaves of the lower plane crowded even on the main stem, spreading, oblique ovate, acute, ¾–1 lin. long, bright green, membranous, unequal-sided, very cordate, shortly ciliated, and much imbricated over the stem on the upper side at the base; leaves of the upper plane half as long, ovate, crowded, shortly cuspidate. Spikes resupinate, ¼–⅓ in. long, above 1 lin. diam.; bracts of the upper plane oblique lanceolate, a line long, very crowded, stiffly erecto-patent; of the lower plane ovate-lanceolate, ascending, much imbricated.

Hab. Hong-kong, *C. Wright*!

259. **S. sandvicensis**, n. sp.—Stems very slender, decumbent, 1½–2 in. long, the root-fibres only near the base, pinnate, the upper branches simple, the lower slightly compound. Leaves of the lower plane spaced on the main stem, contiguous on the branches, erecto-patent, oblique ovate, acute, ½ lin. long, bright green, membranous, unequal-sided, cordate, shortly ciliated, and

much imbricated over the stem on the upper side at the base; leaves of the upper plane much smaller, ovate, acute. Spikes short, resupinate, 1 lin. diam; bracts of the upper plane erecto-patent, oblique lanceolate; of the lower plane ovate-cuspidate, ascending, strongly keeled.

Hab. Sandwich Islands, *Menzies*! in herb. Smith.

260. **S. proniflora**, n. sp. — *S. Belangeri* Spring Mon. ii. 242. —*S. reticulata* Spring Mon. ii. 235. — *S. myosuroides* and *nudicaulis* Spring. — *S. imbricata* J. Scott List. Calc. 62. — *Lycopodium proniflorum* Lam.—*L. imbricatum* Roxb.—*L. Belangeri* Bory in Belang. Voy. Bot. tab. 1, fig. 2. — *L. remotifolium* Desv. — *L. reticulatum* Hook. & Grev. — Stems very slender, trailing, 1–4 in. long, often forked at the base, copiously pinnate, the erecto-patent branches simple or little compound. Leaves of the lower plane spaced below the tip of the branches, spreading, ovate, acute, a line long, pale green, membranous, very unequal-sided, very cordate, strongly ciliated, and much imbricated over the stem on the upper side at the base; leaves of the upper plane half as long, cordate-ovate, acute, not cuspidate. Spikes resupinate, ¼–¾ in. long, ⅛–⅙ in. diam.; bracts of the upper plane erecto-patent, oblong-lanceolate, much imbricated, ¾–1 lin. long; bracts of the lower plane paler, much more ascending, shorter, ovate-cuspidate, strongly ciliated.

Hab. Throughout India from the Eastern Himalayas to Ceylon, the Malay Islands, and North Australia. *S. reticulata* Spring is simply a dwarf form of this species. I cannot by the description separate *S. Junghuhniana* Spring in Pl. Junghuhn. 277.

261. **S. phanotricha**, n. sp. — *S. ciliaris* Cesati Fil. Born. 36, non Spring. — Stems very slender, trailing, 3–4 in. long, forked low down, copiously pinnate, the branches erecto-patent, the lower slightly compound. Leaves of the lower plane contiguous on the branches, rather spaced on the stem, spreading, ovate, acute, under a line long, rather firmer in texture than in *S. proniflora*, very unequal-sided, very cordate, strongly ciliated, and much imbricated over the stem on the upper side at the base; leaves of the upper plane half as long, ovate, cuspidate. Spikes resupinate, short, 1 lin. diam.; bracts of the upper plane oblique ovate, acute, imbricated, erecto-patent; of the lower plane ovate-cuspidate, suberect.

Hab. Borneo, on shady rocks at Labuan, *Barber* 134! Sarawak, *Beccari*!

262. **S. Harveyi**, n. sp.—Stems slender, trailing, 3–4 in. long, sometimes forked low down, copiously pinnate, the erecto-patent branches short, simple or slightly compound. Leaves of the lower plane contiguous on the branches, spaced in the lower part of the stem, spreading, oblong, obtuse, membranous, ¾–1 in. long, nearly equal-sided, subcordate on both sides at the base, serrulate, hardly at all imbricated over the stem; leaves of the upper plane one-third as long, ovate, acute, imbricated. Spikes ¼–⅓ in. long, ½–¾ lin. diam., resupinate; bracts not very distinctly dimorphous, those of the upper plane ovate, acute, erecto-patent; of the lower plane paler and rather shorter, especially towards the base of the spike.

Hab. Friendly Islands, *Dr. Harvey*!

263. **S. leptophylla,** n. sp. — Stems very weak and slender, trailing, densely tufted, 2–3 in. long, distantly pinnate, the branches erecto-patent, the lower slightly compound. Leaves of the lower plane very distant, even on the branches, rather ascending, oblique oblong, subobtuse, a line long, bright green, very membranous, more produced on the upper side of the midrib, broadly rounded, not ciliated, and imbricated over the stem on the upper side at the base; leaves of the upper plane half as long, ovate, shortly cuspidate. Spikes resupinate, ¼–⅓ in. long, 1-12th to 1-8th in. diam.; bracts very dimorphous, those of the upper plane oblique oblong-lanceolate, erecto-patent; of the lower plane ascending, ovate-cuspidate, strongly keeled,

Hab. Formosa, at Tamsuy, *Oldham* 79! A near ally of *S. proniflora.*

(To be continued.)

SHORT NOTES.

Variation in Ulex europæus.—On February 1st I noticed a marked peculiarity in the abundant flowers of a whin-bush on Putney Heath. On looking closely, I found the vexillum of each flower, except one or two imperfect ones, had on each side, near the top, a small extra lobe, about ⅔ of a circle in shape and about ⅛ in. across, turned back at right angles to the rest of the petal. I do not find this variation mentioned in the usual text-books. Several bushes near had slight attempts to follow this one's example, but none had the extra lobe on both sides, and seldom more than a pinched-up corner to the vexillum. One bush, 300 yards away, had one flower with the peculiarity developed on one side. The point indicated does not seem to be touched by the humble bees. It makes the bush showy, and if we are to credit plants with deliberate intentions now-a-days we may hope the fashion may spread.—Donald Matheson.

Saussurea alpina in County Wicklow.—In the course of a week's botanising in the County Wicklow, towards the end of July last (1884), it was my good fortune to discover a well-established colony of *Saussurea alpina*, growing in association with *Alchemilla alpina*, in the cliffs above Lough Ouler, on the south slope of Thonalagee Mountain. This, I believe, is the first and only station recorded for *Saussurea* in eastern Ireland. Lough Ouler lies at an elevation of 1829 feet above sea-level according to the Ordnance Survey, and as I found the plant growing at not more than 100 feet above the lake, this would give about 1900 feet for elevation of the Wicklow habitat.—N. Colgan.

NOTICES OF BOOKS.

The Rev. T. A. Preston has issued, in tabular form, the 'Results of twenty years' observations in Botany, Entomology, Ornithology and Meteorology, taken at Marlborough College, 1865–1884.' We hope to notice more fully this important contribution to our knowledge of periodical phenomena.

New Books.—R. Hartig, 'Der achte Hausschwamen (*Merulius lacrymans* Fr.): (Berlin, Springer, 8vo, pp. vi. 82, tt.). J. L. de Lanessan, 'Introduction à la Botanique': C. Sapin, Paris, 8vo, pp. xii. 276; 103 cuts). J. G. Baker, 'Flora of the English Lake District' (Bell: 8vo, pp. viii. 262).

Articles in Journals.

American Naturalist.—A. F. Foerste, 'Fertilization of *Clematis Viorna.*'

Ann. & Mag. Nat. Hist. — M. J. Berkeley and C. E. Broome, 'Notices of British Fungi' (*Coprinus platypus* Berk., n. sp.).

Bot. Centralblatt (No. 14). — A. Borzi, '*Nowakowskia*, eine neue Chrytidiee (1 plate). — (Nos. 15 and 16). K. B. J. Forssell, 'Die anatomischen Verhältnisse und die phylogenetische Entwicklung der *Lecanora granatina*'. — (No. 17). L. Rischawi, 'Zur Frage über den sogenannten Galvanotropismus.'—C. Fisch, 'Ueber *Exoascus Aceris.*'

Bot. Zeitung (Mar. 27, Ap. 3, 10).—J. Wortmann, 'Ueber den Thermotropisum der Wurzeln.' — (Ap. 17) F. Hegelmaier, '*Wolffia microscopica.*'

Botaniska Notiser (hät 2). — K. B. J. Forssell, 'Analytisk öfversigt af Skandinaviens lafslägten.'

Bull. Bot. Soc. France (xxxii.: Comptes Rendus, Ap. 10). — L. du Sablon, 'Sur un cas de la chute des feuilles.' — G. Rouy, '*Leucojum Hernandezii*, plante française.' — P. Duchartre, 'Observations sur le *Begonia socotrana.*' — J. Vallot, 'Plantes anomales de Cauterets.' — R. Zeiller, 'Fougères recueillies dans la péninsule Malaise, par M. de Morgan' (*Alsophila Bakeri*, *Nephrodium sakayense*, *Polypodium Morgani*, *Selaginella Morgani*, spp. nn.). — E. Guinier, 'Sur les phénomènes de soudure des couches ligneuses qui se rencontrent dans leur accroissement en sens inverse. — J. Constantin, 'Observations critiques sur l'épiderme des feuilles des végétaux aquatiques.' — J. Hérail, 'Sur l'anatomie de la tige des *Strychnos.*'—E. Heckel, 'Sur quelques faits remarkables et nouveaux dans la formation secondaire de l'écorce.'

Bull. Torrey Bot. Club (Feb. and March). — J. Schrenk, 'Notes on *Limnanthemum lacunosum*' (1 plate). — H. H. Rusby, 'On the Mechanism of Anthesis in *Ericaceæ.*' — G. E. Davenport, 'Fern Notes' (*Cheilanthes* and *Botrychium.*)

Flora. — (Mar. 1 and 11) E. Hackel, '*Andropogoneæ novæ*' — (Mar. 11). F. Arnold, 'Die Lichenen des fränkischen Jura.' — (Mar. 21). M. Ebeling, 'Die Saugorgane bei der Keimung endospermhaltiger Samen.'

Gardeners' Chronicle (Ap. 4). — M. Foster, *Iris Vartani*, sp. n. *Eria Elwesii* Rchb. f. sp. n.; *Impatiens Hookeriana* (fig. 80). 'The earliest American Botanic Gardens' (figs. of Bartram's and Marshall's houses). — (Ap. 11). [M. Foster?] *Iris reticulata* var.

sophenensis. Seedpods of *Cypripedium* and *Dendrobium* (figs. 83, 84); *Masdevallia Wallisii* var. *stupenda* (fig. 85). — W. G. Smith, 'Disease of Spinach' (*Peronospora effusa* Grev.: fig. 87. — (Ap. 18) *Aerides Ortgiesianum* Rchb. f., sp. n. — Fruits of *Cattleya Dowieana*, *Brassavola stricta* and *Odontoglossum grande* (figs, 90, 92, 93). — *Epidendrum Endersii* (fig. 91). — (Ap. 25) *Pleurothallis liparanges* Rchb. f.; *Aerides marginatum* Rchb. f., spp. nn. — *Angræcum fastuosum* (fig. 96). — Fruit of *Cattleya Aclandiæ* (fig. 100).

Grevillea (March).—M. C. Cooke, 'New British Fungi.' — Id., 'Synopsis Pyrenomycetum' (cont.). — Id., 'Præcursores Monographia Polypororum.' —W. Phillips and C. B. Plowright, 'New and rare British Fungi' (*Peziza filicum* Phil., *P. jugosa*, *Phacidium striatum*, *Capnodium juniperi*, *Sordaria sparganicola*, *Phomatospora endopteris*, *Melanconis aceris*, *Eleutheromyces longispora*, *Hypocrea argillacea*, *H. strobilina*, *H. splendens*, *H. viscidula*, spp. nn.).

Journ. Linn. Soc. xxi. no. 136 (Ap. 14). — C. T. Druery, 'On a singular mode of development in *Athyrium Filix-fœmina*.'—F. O. Bower, 'On Apospory in Ferns' (2 plates).—C. B. Plowright, 'On the Reproduction of the heterœcious Uredines. — W. T. T. Dyer and D. Oliver, 'Report on Mr. H. O. Forbes' 'Expedition to Timor-Laut.'' — E. M. Holmes, 'On *Cinchona Ledgeriana* as a species.' — F. C. S. Roper, 'On *Ranunculus Lingua*' (2 plates). — C. B. Clarke, 'Botanic Notes from Darjeeling to Tonglo and Sundukphoo.' — J. D. Hooker and D. Oliver, 'Plants collected by Mr. Thomson on the Mountains of E. Equatorial Africa' (*Anemone Thomsoni*, *Delphinium macrocentron*, *Uebelinia rotundifolia*, *Impatiens Thomsoni*, *I. Kilimanjari*, *Crotalaria Thomsoni*, *Psoralea foliosa*, *Sphæranthus gracilis*, *Leucas masaiensis*, *Struthiola Thomsoni*, spp. nn. (all of Oliver); *Selago Thomsoni* Rolfe, sp. n.; *Habenaria pleistadenia*, and *H. Thomsoni* Rchb. f., spp. nn.; *Aristea alata*, *Gladiolus watsonioides*, and *Kniphophia Thomsoni* Baker, spp. nn.).

Journal of Mycology (March and April).—J. B. Ellis and B. M. Everhout, 'Enumeration of N. American *Cercosporeæ*.' —Id., 'New Fungi.'

Magyar Növénytani Lapok (March). — A. Kanitz, 'A Grew-prioritás Kérdéséhez.' — V. Borbás, '*Ceratophyllum Haynaldianum*.'

Nuov. Giorn. Bot. Ital. — J. Danielli, 'Studi sull' *Agave americana*.' — M. De Sardagna, 'Contributo alla flora sarda' (11 plates). — B. Scortechini, 'Sul genre *Pellacalyx* Korth., con descrizione di una nuova specie' (*P. Saccardianus*). — A. Poli, 'Contribuzione alla flora del Vulture.' — A. Piccone, 'I pesci fitofagi e la disseminazione delle alghe.'

Midland Naturalist. — M. C. Cooke, 'Life-history of a filiform Alga (*Œdogonium*).'

Œsterr. Bot. Zeitschrift.. — A. Hausgirg, 'Mykologische und algologische Beiträge' (*Micrococcus ochraceus*, *Glœocapsa salina*, *Nostoc halophilum*, spp. nn.).—A. Baier, 'Teratologisches' (*Leontodon Taraxacum*). — E. Formánek, 'Mährische Rosen,' — A. Toepffer, 'Uebergung zwischen *Equisetum variegatum* and *E. scirpoides*.'—V. v. Borbás, 'Flora von Buccari.' —F. Leithe, 'Kryptogamen Flora von Tirol.' — E. Fick, 'Striefzüge in Russland.

BOTANICAL NEWS.

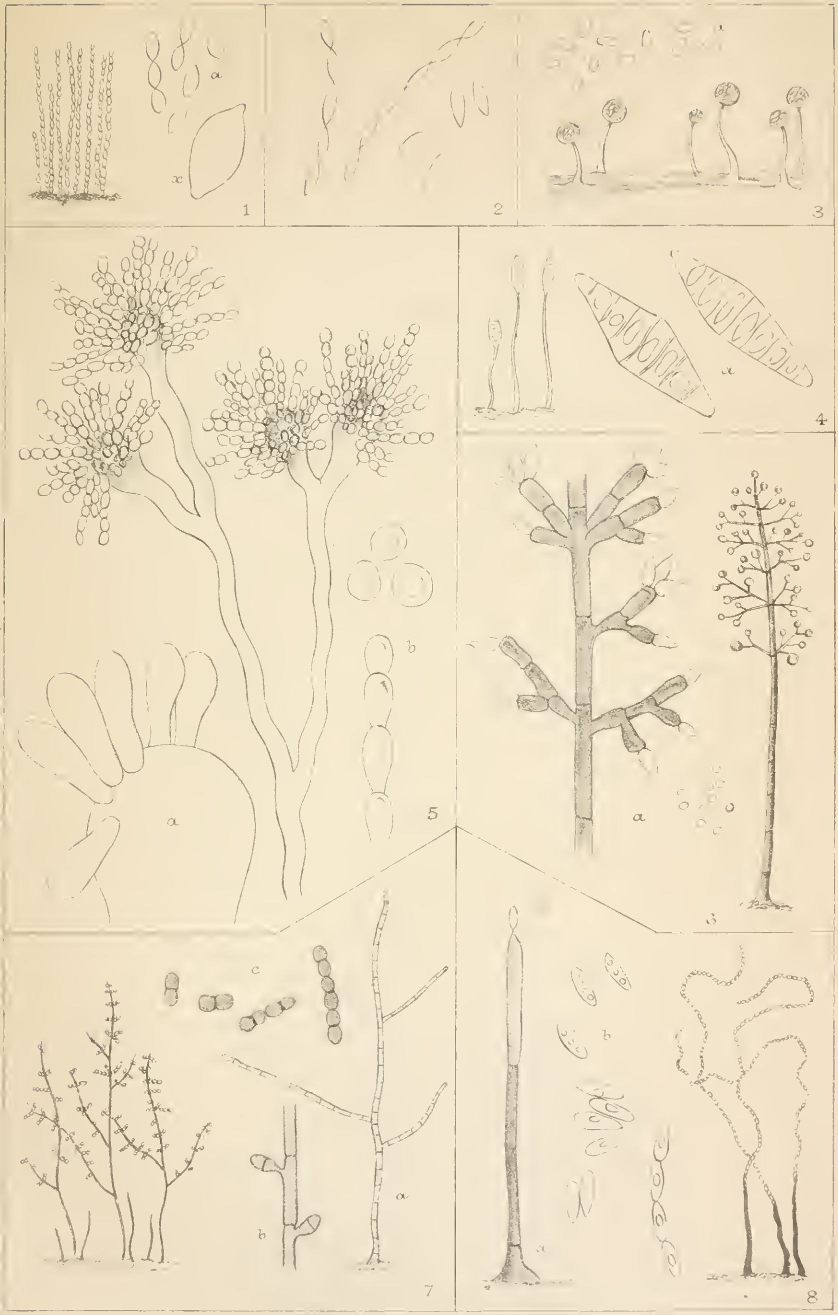
We take the following from the last Annual Report (read Feb. 17) of the Herts Natural History Society:—"The council regrets that your editor has decided to abandon the editorship of the late Mr. R. A. Pryor's 'Flora of Hertfordshire.' He has devoted a considerable amount of time and labour upon it, in preparing a portion of it for the press, and in the subsequent revision of this portion, comprising the orders *Ranunculaceæ*, *Berberidaceæ*, *Nymphæaceæ*, *Fumariaceæ*, and *Cruciferæ*. The first sixteen pages are complete, carrying the work to the end of *Nymphæaceæ*, but, judging from the labour involved in achieving this inconsiderable result, your editor considers that the limited time at his disposal will be better bestowed upon other work for the Society. The thanks of the Society are due to Mrs. Pryor for the donation of £20 towards the cost of editing her son's work. Of this a small amount has been expended in the purchase of a few necessary books and the ordnance maps of the county. The council will endeavour to secure the services of a botanist competent to carry on the work, and who will bring it out in a manner which will do credit to its author, who had an almost unequalled critical knowledge of British plants, combined with a most extensive acquaintance with botanical literature, British and foreign, from before the time of Linnæus to the present time." We can quite understand and sympathise with Mr. Hopkinson's difficulties in carrying out a work for which, we venture to think, he was not specially qualified; but none the less do we regret that the Society, which owes much to Mr. Pryor's generosity, should not see its way to carrying out the work to which a great part of his life was devoted.

Mr. G. C. Druce has issued a prospectus of a 'Flora of Oxfordshire,' which he hopes to publish towards the end of the year. He has secured the help of several botanists acquainted with the botany of the county. "The 'Flora' is intended to be not only a catalogue of the county species, with their localities, but also a history of them, and of the botanists connected with the University and County"; and the prospectus further states that it will contain "about 400 species and varieties additional to those given by Walker and Sibthorp." The work will be printed by the Clarendon Press.

M. A. B. Cole is issuing a series of 'Studies in Microscopical Science' (Baillière, King William St.), which demands a word of notice. The work is issued in three sections; that devoted to botany, of which only we can speak, is excellently planned and well carried out.

Mr. F. O. Bower, of the Normal School of Science at South Kensington, has been appointed Professor of Botany at the University of Glasgow.

Tab. 257



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NEW OR NOTEWORTHY FUNGI:—Part II.

By W. B. Grove, B.A.

(Tab. 256, 257.)

(Concluded from p. 134.)

44. *Leptosphæria cruenta* Sacc. Mich. ii. 318 (1881); Syll. Pyr. ii. 25 (1883).

Perithecia gregarious, the matrix dirty reddish, erumpent, superficial, globose, $\frac{1}{3}$–$\frac{1}{2}$ mm. diam., somewhat smooth, shortly papillate, black; asci cylindrical-clavate, shortly stipitate, $90 \mu \times 10 \mu$, 8-spored; sporidia fusoid, rather acute at each end, somewhat curved, 25–$27 \mu \times 4\frac{1}{2}$–$5 \mu$, 3-septate, the second cell slightly swollen, olivaceous honey-coloured. (Sacc. *l. c.*).

On rotten stems of *Carduus*, nestling among the woody fibres, near Three Shire Oak (St.).* The spores reached 30μ; the perithecia sometimes subconical, opening by a wide pore, at length superficial.

45. *Metasphæria rubella* Sacc. Syll. Pyr. ii. 161 (1883)—*Leptosphæria r.* Sacc. et Malbr. Mich. ii. 598 (1882)—non *Sphæria rubella* Pers.

Perithecia innato-erumpent, the matrix sanguineo-violaceous, globose-conical, papillate, then depressed, $\frac{1}{3}$ mm. diam., black; asci cylindrical, $150 \mu \times 7 \mu$; sporidia distichous, fusoid, nearly straight, 25–$26 \mu \times 4$–5μ, triseptate, 4-guttate, hyaline, not or scarcely constricted. (Sacc. *l. c.*).

On dead stems of *Carduus*, near Three Shire Oak (St.), April, May. The broad pale violaceous stain very conspicuous. In my specimens the perithecia were globose-lenticular, scarcely erumpent; the sporidia 32–$43 \mu \times 5$–7μ, somewhat curved, obtuse at each end, 1- then 3-septate, fusiform when young, but when mature with the second cell considerably swollen; the guttæ ultimately disappearing, but the sporidia always perfectly hyaline; paraphyses numerous, filiform, articulate. On the upper part of the same stems were *Ophiobolus acuminatus* Duby, and *O. porphyrogonus* Sacc., both easily recognisable by the conical protruding ostiola. On the lower part of many, where the woody fibres were laid bare, was *Leptosphæria cruenta* Sacc., from which, however, this species appears to be distinct, for the hyaline sporidia were probably mature and the habit is different.

46. *Sphærulina intermixta* Sacc. Fung. It. 347 (1878); Syll. Pyr. ii. 187 (1883).—*Sphæria int.* B. & Br. Cooke, Handbk. p. 889. Var. ABBREVIATA mihi.

Perithecia collected in short parallel lines, surrounded by the ruptured epidermis; asci long collected into a globose bundle, oblongo-clavate, scarcely stipitate, 50–70 μ × 10–15 μ, without paraphyses; sporidia clavato-pyriform (like the sole of a slipper in outline) 20–25 μ × 7–8 μ, very obtuse at one end, more pointed at the other, di-tristichous 3–4-septate, slightly constricted, hyaline.

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* The ground, on which this and the other fungi mentioned herein from "near Three Shire Oak" were found, is actually in Staffordshire, but is only a few yards distant from Warwickshire and a part of Worcestershire.

On *Rubus fruticosus* Langley (Wk.), April. This would appear to be the form intended by Saccardo in his note (Syll. Pyr. ii. 188); what its relation is to the *Sphæria abbreviata* of Cooke (Handbk. p. 893) I do not know, but I suspect some mistake in the description of the latter. I find a *Hendersonia* (? *Rubi* West.) and a *Diplodia* with the *Sphærulina.*

47. *Phyllosticta betulina* Sacc. Mich. i. 154 (1878); Syll. Fung. iii. 32 (1884).

Spots none; perithecia epiphyllous, here and there densely aggregated, innate, somewhat prominent, globose-lenticular, black; sporules oblong, 10 μ × 2½ μ, hyaline.

On living birch leaves, Rednal (Ws.); Fen End (Wk.); Aug., Sept. Sporules rather larger than in Saccardo, but otherwise agreeing.

48. *Phoma ilicis* Desm. Sacc. Mich. i. 525 (1879); Syll. Fung. iii. 106 (1884).

Perithecia punctiform, veiled by the epidermis, black, roundish, somewhat prominent, pierced by a pore; sporules cylindrical, rounded at each end, 12–15 μ × 3 μ, hyaline, often with a globule at each end. (Sacc. *l. c.*).

On dead leaves of *Ilex Aquifolium*, near Three Shire Oak (St.), April. The spores in my specimens were rather larger, reaching from 16 to 18 μ. Perithecia scattered, surrounded by a brownish stain, about ¼ mm. in diam.; epidermis at first elevated over the centre of each in a little white spot, then pierced by the somewhat papillate black ostiole. It does not differ much from *Phoma cylindrospora* Desm. on ivy leaves (Handbk. p. 426, *Sphæropsis*).

49. **Phoma sanguinolenta**, sp. n. — P. peritheciis laxe gregariis, atris, opacis, ⅓ mm. diam., epidermide libroque solutis inter fibras ligneas flexuosas splendide purpureo-tinctas nidulantibus, demum emersis, globosis compressisve, conico-papillatis, hyphis purpureis parce septatis, 3 μ crassis, vestitis; sporulis ut *Phomæ rubellæ.*

Ad basin stipitum *Cardui* putrescentium, eodem loco quo *P. rubella*, socia *Leptosphæria cruenta*, cujus haud dubio spermogonium.

50. **Phoma rubella**, sp. n. — P. peritheciis gregariis, olivaceis, tenuibus, ⅓–¼ mm. diam., lenticularibus, breve papillatis, sub epidermide late cruentata immersis, ostiolo pertuso, vix emergente; sporulis oblongis, utrinque 1-guttatis, 6–7 μ × 2½–3 μ, rectis, hyalinis.

In caulibus emortuis *Cardui*, prope "Three Shire Oak (St.)," Aprili, Maio, socia *Metasphæria rubella* Sacc. cujus vix dubio spermogonium habenda.

51. *Hendersonia culmicola* Sacc. Mich. i. 210 (1878) *nec* Cooke.

Var. *minor* Sacc. Fung. Ven. ii. 322 (1875); Syll. Fung. iii. 437 (1884).

Perithecia minute, globoso-papillate, black, innato-erumpent; sporules cylindrical, somewhat curved, 25 μ × 3 μ, 3-septate, yellow. (Sacc. *l. c.*).

On the dead culms of a small grass (? *Poa*), near Three Shire Oak (St.), April, May. Spores cylindrical or subfusoid, 20–26 μ × 3½ μ, pale yellowish. Distinguished from *H. graminicola* Lev. by its more slender and paler spores.

52. **Stagonospora pini,** sp. n. — S. peritheciis epiphyllis, tectis, sparsis, rotundatis, atris; sporulis pallide luteolis, singulis hyalinis, cylindraceo-fusoideis, utrinque subobtusis, 1- dein 3-septatis, 16–20 μ × 3–4 μ.

In foliis *Pini sylvestris*, Hibernia (H. W. Lett), August.

53. *Septoria cytisi* Desm. Sacc. Syll. Fung. iii. 485 (1884).

Spots amphigenous, minute, white, dried up, girt with brown, subrotund; perithecia 1–3, epiphyllous, brown-black, very minute, opening by a pore; sporules very long, curved or flexuose, multiseptate, hyaline, 90–100 μ × 3½ μ.

On living leaves of *Cytisus Laburnum*, Bradnock's Marsh (Wk.), Aug. With *Phyllosticta cytisi* and *Leptosphæria Lucina*.

54. *Septoria dianthi* Desm. Sacc. Syll. Fung. iii. 516.

This I had previously (Journ. Bot. May, 1884) considered as recorded in 'Grevillea,' v. 70; but having by the kindness of Mr. C. J. Muller seen the specimens (Cooke, exs. i. 429) there referred to, I find them to be widely distinct. They are on *Saponaria*, and may be either *Septoria dimera* Sacc. or a species of *Ascochyta*.

55. **Oospora rosella,** sp. n.—O. hyphis fasciculatis, demum effusis, longis, erectis, dein vagantibus, ramosis, 2–3 μ crass., continuis, hyalinis; conidiis in catenulas longiusculas simplices connexis, roseis, ellipticis, utrinque apiculatis, 10 μ × 4 μ.

In stercore equino, "Edgbaston" (Wk.), Feb.—Maio. Cæspitulis ⅓–1 mm. altis, demum confluentibus, *Ooсporæ fasciculatæ* (Grev. *sub Acrosporio*) affinis, sed conidiorum colore distincta.

56. *Oospora candidula* Sacc. Fung. Ital. 880 (1881): Mich. ii. 545 (1882).—*Torula candida* Opiz.? Sacc. Mycol. Ven. Sp. p. 177 (1873).—non *Oospora candida* Wallr. Fl. Crypt. p. 182 (1833).

Tufts effused, pure white, thin; sterile hyphæ creeping, filiform; fertile, erect, simple or forked, 30 μ × 3 μ, continuous, hyaline; conidia in long chains, ovate-oblong, 5–6 μ × 3 μ, hyaline.

On *Tubercularia vulgaris*, *Nectria cinnabarina*, and the adjacent bark, Sutton (Wk.), September.

57. *Oospora fusca* mihi.—*Alysidium fuscum* Bon. Handb. p. 35, fig. 13 (1851); ? Fckl. Symb. Myc. p. 350, *in ligno* (1869).

Forming a clear brown powder, which often covers the whole exterior and disc of the host; chains of conidia at first erect, but soon becoming depressed and intricate; conidia fusiform, clear ochraceous-brown, 6–8 μ × 3½–4 μ, reaching even 10 μ × 5 μ. (Tab. 257, f. 1).

On *Bulgaria inquinans*, Sutton (Wk.), Oct., Dec. The spores are not only much smaller, but also paler and more hyaline than those of *Oidium fulvum* Link, and of a different colour.

58. **Fusidium viride**, sp. n.—F. mycelio albo, tenuissime effuso; conidiorum catenulis longis, flexuosis, varie intertextis; conidiis exacte fusiformibus, rectis, utrinque acutis, pallide viridulis, 10 μ × 3 μ. (Tab. 257, fig. 2.).

In caulibus *Heraclei* emortuis, maculas sub-ellipticas 1–1½ cm. long. amœne saturato-virides (confervoideas) efformans, apud "Bradnock's Marsh" (Wk.), Aug.

CEPHALOSPORIUM CORDA (1839).

Hyphasma creeping, branched, continuous. Flocci stem-like, rather subulate, continuous, crowned with a head of spores. Spores simple.

Differs from *Acremonium* in the capitate spores.

59. *Cephalosporium Acremonium* Corda, Ic. Fung. iii. 11, pl. ii. fig. 29 (1839); Bonord. Handb. p. 108 (1851); Fres. Myk. p. 94, pl. xi. figs. 59—63 (1863); Sacc. Mich. i. 271 (1878); Fung. Ital. 706 (1881)—*forma major*, Penzig, Fungh. Agrum. 100 (1882): Sacc. Fung. Ital. (1882).

Effused, pure white, floccose; hyphæ creeping, nearly simple or branched, bearing alternately rather short, erect, sporiferous branches, which are mostly simple, and attenuated above; conidia conglobate at the apices, involved in mucus, oblong or ovoid, hyaline, about 3 μ × 2 μ (Corda, *ex icone*), 3·3–6 μ × 1·5–2 μ (Fres.); 4 μ × 1 μ (Sacc.); 4·5–5 μ × 2·5 μ (Penz. *forma*); 5–8 μ × 1·5–2·5 μ (mihi). (Tab. 257, f. 3).

On stems of *Rubus*, Barnt Green (Ws.); of *Heracleum*, Bradnock's Marsh; on rotting wood and a *Myxomycete*, Sutton (Wk.), May—Oct. Heads round, pure white, about 10–12 μ diam., but varying in size from age. The long creeping stems are sometimes suberect; the branches often once, sometimes twice forked, 30–40 μ high or more. Corda describes the spores as assuming a rosy tint, which no other author has observed. My specimens belong rather to Penzig's form, but scarcely differ from Corda's figure, except in the more oblong spores.

60. **Aspergillus spiralis**, sp. n.—A. hyphis sterilibus dichotomis, septatis, effuso-intricatis, spiralibus, citrinis; fertilibus luteis, erectis, continuis, semel bisve apice dichotomis, ramulo unoquoque in capitulum subclavatum evadente; sterigmatibus simplicibus, obovatis, medio constrictis (h. e. soleiformibus), 20–30 μ × 10 μ; conidiis obovatis, dein globosis, inæqualibus, lævibus, luteis, ut plurimum 10–12 μ. (Tab. 257, f. 5).

In subere, quo phiala solutionis ammonio-carminaceæ plena occludebatur, Birmingham (Wk.) Conidia 8–15 μ longa, inferiora obovata. Flocci steriles eximie spiraliter contorti æque ac infra fertiles; hi quidem sæpe usque ad apicem spirales.

GLIOCLADIUM Corda (1840).

Stem erect, septate, penicillate above, branches and branchlets septate, crowned by a common gelatinous head. Spores acrogenous, irregularly heaped together, simple, with a gelatinous coat. Differs from *Penicillium* in the spores being produced singly, not in chains, but remaining united in the mucous substance simultaneously excreted.

61. *Gliocladium penicillioides* Cord. Ic. Fung. iv. 31, pl. vii. fig. 92 (1840); Bonord. Handb. p. 94 (1851).—(?) *Penicillium socium* Sacc. Syll. Pyr. p. 468, *sub Hypomyc. aureo-nit.* (1883); cfr. Plowright, Grev. xi. 49, pl. 156, figs. *b—d* (1882).

Tufts minute, punctiform, white; stems erect, flexuous, thickened above, white; branches opposite, branchlets whorled, quaternate, crowded; head of spores globose, white; spores 5½ μ long, conglutinate, oblong, surrounded by a thick gelatinous stratum. (Corda, *l. c.*). (Tab. 256, f. 9).

On the hymenium of an old *Stereum* (probably *hirsutum*), Trickley Coppice (Wk.), Sept. Stems about 120–180 μ high (Corda, 220—380 μ); the gelatinous heads of neighbouring stems unite, even 15—20 being thus bound together with one large common head. The resemblance of the *Gliocladium* to the *Penicillium* is striking, but I could not ascertain that the spores were ever in chains in my specimens, and the abundant gelatinous secretion of the former is a marked feature, which Mr. Plowright informs me he did not notice in the conidia of the Hypomyces figured in 'Grevillea' (*l. c.*). I could not perceive in my spores the gelatinous coat which Corda figures; they measured 5 μ × 2 μ, and were extremely abundant. The stems were thrice bi-tri-chotomous, the branchlets being parallel and appressed.

62. *Penicillium subtile* Berk. Handb. p. 603. Var. RAMOSIUS mihi.

Hyphis sterilibus repentibus; fertilibus erectis, sæpe apice ternatis, paucis infra apicem ramis instructis; conidiis in catenulas curtas quaternis-octonis connexis, hyalinis, crasse ellipticis, utrinque apiculatis, 16–20 μ × 10 μ.

In ligno putri, "Hampton-in-Arden" (Wk.). Omnino candidissimum et tenerrimum.

SPICARIA Harz (1871).

Hyphæ erect, verticillately branched. Conidia in lax apical chains, ovoid or oblong.

Distinguished from *Penicillium* by the divergent chains of spores.

63. *Spicaria elegans* Harz. Hyphomyc. 51 (1871); Sacc. Fung. Ven. v. 194 (1876); Mich. ii. 359 (1881); Fung. Ital. 895 (1881). —*Penicillium elegans* Corda, Icon. ii. 18, pl. xi. fig. 74 (1838).

Stem slender, straight, equal, simple or dichotomous, 150–250 μ × 4–5 μ; branches verticillate or opposite, ultimate ramuli (basidia) most often in threes; conidia elliptic or ovate, acute at each end, 9 μ × 3 μ (mihi); 3–4 μ × 2 μ or 5 μ × 3 μ (Sacc.) (Tab. 256, fig. 8).

On dead moss and rotting wood, Sutton (Wk.), Sept., forming a thin white pulverulent stratum.

64. *Rhinotrichum Thwaitesii* B. & Br. Cooke, Handbk. p. 590. —Var. FULVUM mihi.

Typo præter colorem fulvum conidiaque paulo læviora simillimum.

In ligno putri, "Hampton-in-Arden" (Wk.), August. Denique fere fuscum.

65. **Dactylella rhombospora**, sp. n.—D. sparsissima, tenerrima, *D. minutæ* simillima, nonnisi conidiorum figurà differens, quæ crasse fusoidea sunt, quasi rhomboidea, utrinque rotundata, guttulata. (Tab. 257, fig. 4).

In ligno putrescente corticeque parcissime dispersa, "Selly Oak," prope Birmingham (Ws.), Sept. In genere Dactylella nunc hyphas fertiles *septatas* erui.

**Ramularia Lapsanæ* Sacc. Fung. Ital. 995 (1881); Mich. ii. 549 (1882).—*Fusidium cylindricum* Fckl. Sym. Myc. p. 371 (1869); Ph. et Pl. Grevillea, iv. 120 (1876); et aliorum, *nec* Cordæ. —*Cylindrium Cordæ* Sacc. Fung. Ven. v. 186 (1876); Mich. i. 535 (1879).

Hyphæ tufted, erect, simple or shortly branched, 30–50 μ × 3 μ. continuous; conidia cylindric-fusoid, 10–15 μ × 3·5–4 μ, hyaline, continuous, in branched chains.

Forming small roundish patches on the lower face of living leaves of *Lapsana communis*, Hampton, Barston, &c. (Wk.). Aug. Sept.

HYALOPUS CORDA (1838, *emend.* 1840).

Stem erect, hollow, filiform, continuous or septate: hyphopodium none or spurious. Conidia capitate, simple, conglutinate, acrogenous.

This genus requires revision; the other species mentioned by Corda (Ic. ii. 16) are not congeneric with the one here recorded, for which a new genus should be formed. This I hope Professor Saccardo will do in his forthcoming 'Sylloge Fungorum,' vol. iv.

66. *Hyalopus ater* Corda, Ic. iv. 29, pl. vii. fig. 89 (1840); Bon. Handb. p. 80 (1851).—*Stilbum atrum* Rab. Krypt. Fl. 123 (1844).

Effused, black, velvety; hyphopodium thin, yellowish, grumous; stem simple, filiform, subulate, septate, diaphanous, pallid above, brown below; head of spores globose, white, then yellowish; spores oblong, obtuse, hyaline, 5–6 μ × 2½–3 μ. (Tab. 256, fig. 6.)

On decayed wood Sutton (Wk.), Oct.—April. Stems occcuring in little tufts, surrounded at the base by a grumous mass, 200–250 μ

× 5 μ: the spores are formed singly and remained united by a mucous secretion. It is a dematioid Cephalosporium.

67. **Haplographium bicolor,** sp. n. — H. hyphis gregariis, effusis, subinde binis ternisve basi connatis, erectis, strictis, septatis, fusco-atris, opacis, apice pallidioribus, rotundatis, basi bulbosis, 250–300 μ × 8 μ; sterigmatibus dense radiantibus, pallescentibus, ter penicillatim fasciculato-ramosis, capitulum turbinatum v. obconicum efformantibus, 25 μ long., persistentibus; conidiis oblongis v. ovatis, subacutis, hyalinis, 4–5 μ long., muco obvolutis, in massam apicalem pallide melleam obovatam congestis.

In ligno molli putrescente, "New Park, Middleton" (Wk.), April. *Graphio tenuissimo* Ca. affine, sed sterigmatibus ramosis distinctum.

**Stachylidium cyclosporum* Grove.—Having found fresh specimens of this near Three Shire Oak (St.), April, I am enabled to add to my previous description (Journ. Bot., July, 1884) that the basidia are slightly thickened and spiculate at the tip; the spores are sometimes not quite round, even measuring 3 μ × 2 μ. (Tab. 257, fig. 6).

CHALARA Corda (1838).

Hyphæ simple, rather short, straight, brown. Conidia in apical chains, hyaline, cylindrical, truncate at each end, or fusoid.

According to Saccardo, the spores spring from the *interior* of the hyphæ, as in *Sporoschisma*, but it is not so in all the species. *Cylindrosporium longipes* Pr. (Grevillea, vi. 126) belongs to this genus, and is allied to the following species.

68. **Chalara longissima,** sp. n. — C. hyphis fertilibus dense gregariis, erectis, rigidis, strictis, septatis, æqualibus, 150–170 μ × 4–5 μ, infra fuscis, supra pallidioribus et sæpe subinflatis, in catenam conidiorum albam flexuosam stipite duplo longiorem evadentibus; conidiis fusoideis, irregularibus, utrinque subacutis, fere hyalinis, continuis, 1–4-guttulatis, 10–11 μ × 3½–4 μ. (Tab. 257, fig. 8).

In ligno putri, "Trickley Coppice" et "Windley Pool" (Wk.), Sept., Oct.

DIPLOCOCCIUM, gen. nov.†

Dematioideum, macronemeum. Hyphæ fertiles æquales, septatæ, ramosæ, olivaceæ. Conidia catenulata, didyma.

Genus *Cladotricho* affine, quoad hyphas autem ad quasdam *Polyactidis* et *Menisporæ* species vergit.

69. **Diplococcium spicatum,** sp. n.—D. olivaceo-brunneum; mycelio conspicuo, nitido, in ligni superficie repente; hyphis fertilibus gregariis, subfasciculatis, filiformibus, subflexuosis, pellucido-olivaceis, erectis, septatis, 200–300 μ long., 4–5 μ crass.,

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† Diplococcus, a name given to two united Micrococci; διπλοῦς, double; κόκκος, a berry.

simplicibus v. paucis ramis longiusculis alternis subpatentibus instructis; conidiorum catenulis curtis, patentibus, secundum ramos et prope apicem stipitis spicatis, oppositis v. verticillatis; conidiis in catenula quaque ternis v. quaternis, diplococcoideis (h. e. oblongis, ad septum constrictis) olivaceo-pellucidis, 9–10 μ × 4½–5 μ. (Tab. 257, fig. 7).

In ligno putrido, "Sutton" (Wk.), Oct. Etiam in peritheciis sociæ *Ceratostomellæ restitæ* Sacc., cujus pilos stipites steriles imitantur, et cujus status conidicus videtur. *Diplosporio nigrescenti* Link (Sp. Pl. i. 64) subsimile, at *Cladotricho stricto* Sacc. affinius. Hoc immo, auctore ipso monente, *Diplococcio* adscribendum.

70. *Helminthosporium cylindricum* Corda, Sturm. xi. 21, pl. 11 (1831); Fries, Syst. Myc. iii. 357 (1832); Rab. Krypt. Fl. p. 109 (1844); Sacc. Fung. Ital. 829 (1881).

Effused, brown, velvety. Hyphæ long, simple, slender, acute, straight, black, opaque; conidia narrow, cylindrical, acute or obtuse, 3–4-septate, diaphanous.

On dead hazel, Witton (Wk.), March. My specimens differ from Corda's description and figure in some respects, but resemble closely that of Saccardo. The hyphæ are shorter and semipellucid, the septa being plainly visible; conidia 20–30 μ × 3–4 μ, of exactly the same width as the flocci, and 3–8-septate, septa indistinct. Saccardo gives the size as 14–15 μ × 2½ μ, and figures one spore with about six septa.

71. *Helminthosporium inconspicuum* C. & E., Grevillea, vi. 88, pl. 99, fig. 19 (1878). Var. BRITANNICUM mihi.

Effusum, brunneolum; hyphis subflexuosis, vix nodulosis, 4–5-septatis, pallide brunneis, 160–180 μ × 10 μ; conidiis oblongis, diaphanis, endochromate brunneolo diviso, dein 3–5-septatis, 60–100 μ × 18–22 μ.

In foliis languidis gramineis, "Salford Priors" (Wk.), Aug. A typo differt hyphis brevioribus, conidiis obtusis, et eo quod oculo inarmato non omnino inconspicuum; ab *H. tereti* Sacc. (Fung. Ital. 833), quocum conidia figura perfecte congruunt, macularum defectu, conidiis non obscure olivaceis. Inter hoc ac illud medium.

72. *Acrothecium tenebrosum* Sacc., Mich. i. 74 (1877); Fung. Ital. 6 *a* (1877). — *Cacumisporium tenebrosum* Preuss, Sturm. 35, p. 117, pl. 59 (1861); Bon. Handb. p. 285 (1851).

Tufts broad, black; flocci erect, septate, simple, black-brown, thickened below, pallid above, 200 μ × 5–6 μ; conidia clustered at the apex, large, oblong, rounded at each end, curved, subdiaphanous, brown, 3-septate, 18–20 μ × 5–6 μ. (Tab. 256, fig. 7).

On dead wood, Kenilworth; Sutton (Wk.), July, December. Spores at first hyaline, guttulate, then pale brown, immersed in a little mucus. It does not differ much from *Helminthosporium apicale* B. & Br., except in the more numerous and uniformly-coloured spores.

73. **Pachnocybe clavulata,** n. sp. — Stipite erecto, rigido, filiformi, nitido, fusco, infra denigrato; capitulo stipitem æquante

vel leviter superante, paululo crassiore, clavulato, obtuso v. acutiusculo sed nunquam subulato, conidiis rotundatis v. ovalibus, minutissimis, 2 μ crass., pruinato. (Tab. 256, fig. 10).

In ligno decorticato emortuo "Hampton-in-Arden" (Wk.), Aug. Stipites sub gregarii, 300–500 μ alti.

74. *Epicoccum granulatum* Penzig, Fungh. Agrum. Mich. ii. 487 (1882); Sacc. Fung. Ital. 1215 (1882).

Stromata gregarious, confluent, pulverulent, very black (?), hemispherical; hyphæ and basidia yellow, then brown, articulate; conidia brown, then blackish olive, roundish, not pedicellate, pluricellular, punctato-granulose, 20–28 μ diam.

On culms and sheaths of *Dactylis glomerata*, near Three Shire Oak (St.), April. Stromata bright (gamboge) yellow, then dull yellow, at last brown, somewhat sanguineous at the very base, seriate and confluent between the nerves. The pulverulent look arises from the non-compact basidia. The spores are elliptical or roundish (as in figure, *l. c.*), distinctly composed of 4–5 roundish connate cells; surface finely verruculose, not reticulate.

Description of Plate.

Tab. 257.—Fig. 1. *Oidium (Oospora) fuscum* × 150; *a*, spores × 500; at *x*, a spore of *O. fulvum* for comparison. 2. *Fusidium viride* × 500. 3. *Cephalosporium Acremonium* var. *majus* × 250; *a*, spores × 500. 4. *Dactylella rhombospora* × 120; *a*, spores × 500. 5. *Aspergillus spiralis* × 250; *a*, head with basidia × 500; *b*, chain of obovate and separate globular spores × 500, 6. *Stachylidium cyclosporum* × 150; *a*, portion of stem and spores × 500. 7. *Diplococcium spicatum* × 120; *a*, stem × 150; *b*, part of same × 250; *c*, spores × 500. 8. *Chalara longissima* × 150; *a*, stem × 400; *b*, spores × 500.

A NEW SPECIES OF *CATHARINEA* EHRHART.

By H. N. Dixon, M.A.

Catharinea Dixoni *Braithw. MS.* Description:—In small tufts; dark green. Rhizome tomentose. Stems erect, simple, about one inch high, naked below. Leaves lax below, rather crowded above; slightly sheathing, concave, keeled; erecto-patent when moist, crisped when dry. Lowest small, scale-like, ovate, apiculate, entire; the rest increasing in size upwards, at first shorter and spathulato-oblong, above narrower and elongato-lanceolate, tapering to a point; not undulate. Nerve reddish, excurrent into a short but decided apiculus, toothed at the back above. Leaves not bordered, with a single row of sharp brownish teeth, commencing at about one-third from the base; not spinulose at the back. Cells larger and more regularly quadrate than in *C. undulata*, quadrate below, quadrato-hexagonal above and rounded, especially towards the apex and margin; arranged in longitudinal rows in the disk of the leaf, more irregular and smaller towards the margin; chlorophyllous above, hyaline below. Lamellæ numerous, crowded; varying much in number, sometimes as many as 32; occupying much of the breadth of the leaf, especially towards the apex; in section of from three to five almost equal cells.

Fructification unknown.

Habitat:—On earth, on and about the roots of elms, near Northampton. First found by the writer, April 3rd, 1884.

This moss has been submitted to Dr. Braithwaite, who will figure it in a supplementary plate to vol. i. of the 'British Moss Flora,' and who has kindly informed the writer of his intention to name it *Catharinea Dixoni*.

It will be observed from the description that it differs from all known species of *Catharinea*, except *Atrichum parallelum* Mitt. (Journ. of Linn. Soc., vol. viii. p. 48, tab. viii; Lesquereux, 'Mosses of North America,' p. 258), in the absence of border to the leaves; and from all known species in the large number of lamellæ. Whether these two points are sufficient to separate it from *Catharinea* is a question that must be left undecided in absence of fruit; but the habit and general leaf-structure are distinctly those of that genus. For the present Ehrhart's definition must be widened with regard to those points, so as to include these two species.

A NEW *HABENARIA* FROM BRAZIL.

By H. N. Ridley, M.A., F.L.S.

Habenaria Melvillii, sp. n. — Tubera lanata clavata. Folia duo, ovata obtusa patentia petiolata, 7-nervia; lamina majoris 2 uncias longa, 1½ lata, petiolus vix uncialis. Scapus brevissimus 1½ uncia longus. Flores duo magni. Sepala ovata obtusa, lateralia parum obliqua patentia. Petala bifida, lacinia antica erecta, ligulata obtusa falcata, postica longior recta linearis multo angustior, acuminata. Labellum trifidum, laciniæ laterales lineares acuminatæ, media brevior, obtusa. Calcar longissimum 4-unciale, pendulum rectum, apice paullo dilatato. Columna brevis lata. Anthera haud apiculata, apices longæ curvæ.

Cidade de Entre Rios, Minas Geraes, Brazil, coll. H. C. Dent.

The British Museum Herbarium is indebted for this interesting plant to Mr. J. Cosmo Melvill, whose name I have great pleasure in associating with it. It is remarkable for the broadly ovate-petiolate leaves, and the very short flower-stem bearing one (or two) rather large violet and white flowers, and with a spur more than twice the length of the stem. The dorsal sepal is five-eighths of an inch long, the laterals a little longer. The petals are bifid; the upper lobe about the length of the dorsal sepals; the lateral lobe a little over an inch long, much narrower, and tapering away to a fine point. The lip has a short narrow base, ending in three narrow linear lobes; the two outer ones nearly an inch and a quarter long, tapering gradually to a point, the middle one broader, shorter, and blunt. The long upcurved anther-processes are nearly three-eighths of an inch in length.

NOTES ON THE FLORA OF CEYLON.

By Henry Trimen, M.B., F.L.S.

(Continued from p. 145).

Sonneratia alba Sm.—Mangrove swamps at Chilan, on the west coast, November, 1881. I am indebted to H. Nevill, Esq., for specimens of this interesting addition to our flora. It grows with the common Ceylon species, *S. acida* L. f., from which it is readily distinguished by the absence of petals, the longitudinally 6-ribbed calyx-tube, the depresso-turbinate and shortly apiculate fruit, and other characters. This adds another to the numerous Ceylon plants which, though found in the Malay Peninsula and Islands, do not reach the Peninsula of India.

Blepharispermum petiolare DC.—Not uncommon about Tissamaharama, Kirinida, Hambantota, &c. A remarkable straggling shrub, the woody stem attaining an inch in diameter, and climbing by its horizontal branches. It appears to have been first collected by Klein in 1796, and his description is quoted by DC. in Wight's 'Contrib.,' p. 12, where the species is founded. Klein's locality is given there as "prope Ugandamalej," in Ceylon. This locality is omitted in DC. Prod. v. 368, nor until now has anyone since recorded the species for this island. I can find no place with a name similar to that above given,* nor am I aware whether Klein ever visited Ceylon. Wight gathered the plant at Courtallum, but it appears to be a very scarce species.

Tithonia diversifolia A. Gray in Proc. Amer. Acad. xix., p. 5 (1883) (*Mirasolia* Hemsl.).—This very handsome "sun-flower" from Mexico has now become one of the commonest weeds of Ceylon, and is always an object of notice by travellers, who of course think it a native plant. It attains 8 or 10 ft. high, and its large heads, 4 or 5 in. in diameter, are of a singularly brilliant yellow. It often lines the roadsides for long distances, and in places rivals *Lantana* in abundance, whilst it has a much wider climatic range in the island than that extraordinary weed of hot moist regions. It is, however, a much later introduction here, for Dr. Thwaites told me that he remembered receiving the seed from Dr. Lindley in 1851, as then recently obtained from California; it has no doubt spread from Peradeniya. I see from A. Gray's memoir, above quoted, that it has been collected in Mexico near Orizaba and Cordoba by Botteri and Bourgeau, and that it is figured in Godman's 'Biologia Cent. Americana,' Botany, ii. t. 47, a work I have not seen. It is singular that this familiar Ceylon weed should thus have remained unnamed till within the last three or four years.

Lobelia excelsa Lesch., var. *trichandra* Wight (sp.).—In the Maskeliya District of the Central Province, at an alt. of about 5000 ft. This is the plant figured in Wight's 'Icones,' t. 1171; it is well enough distinguished as a variety by the leaves being perfectly glabrous on both surfaces, the branched inflorescence, the pure white flowers, and the anthers with strongly marked lines of hairs. Clarke ('Fl. Brit. Ind.' iii. 427), following most authors, makes *L. nicotianæfolia* Heyne a distinct species, and gives both for Ceylon; but I agree with Thwaites ('Enum.' p. 170) that we have but one. This is usually densely pubescent throughout (except on upper surface of leaves), as in Wight's figure, 'Icones,' t. 1172, under Moore's name, *L. aromatica*. At high elevations, as at Nuwara Eliya, where it is a most abundant plant, the racemes are very dense, and the flowers pale dull purplish-pink; but at lower elevations the flowers are more laxly arranged, and the corolla nearly white, but these characters are insufficient for even varietal distinction.

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* Mr. Nevill suggests Ukanda, a village on the east coast, within forty miles of the places where I found the plant.

Tylophora flava Trim., n. sp.

Cordia Rothii, R. & S. — At Mandagula Tank, four miles from the Kumbukan River, in the almost unknown region of the Panuwa Pattu, E. Province. Sent to me in fruit by Mr. H. Nevill in October, 1884. He tells me that it forms a small drooping tree 18–20 ft. high. The *C. Roxburghii* of Clarke ('Fl. Brit. Ind.' iv. 138), given as a Ceylon species, is, I am informed by Mr. Hemsley, identical with *C. salicifolia* Cham. of Brazil. Some error as to locality was probably made in Herb. Roxburgh.

Ipomæa bracteata Wight.—As a weed in Liberian Coffee Estates near Kalutara, Western Province, March, 1880, Mr. W. Ferguson. Perhaps a casual introduction from Southern India, but an inconspicuous species, and readily overlooked.

I. staphylina R. & S. (*I. racemosa* Roth, non Poir.).—I collected specimens of this species near Kurunequla, on the Dambulla road, in December, 1883. It is stated to be a common plant in the Indian Peninsula, and also to occur in Assam and at Penang.

Convolvulus parviflorus Vahl.—This common Indian species is abundant near Tissa-maha-rama, but I have not heard of its occurrence elsewhere in Ceylon. It has a wide distribution through Tropical Africa, Asia, and Australia.

Striga orobanchoides Benth. (*Orobanche indica* Spreng., non Roxb.).—This is a common enough plant in the dry Hambantota district. I have also found it abundantly near Anuradhapura, N. Central Province. It is especially fond of the roots of *Euphorbia antiquorum*, an abundant tree in the dry country. The plant is pale green, and the flowers white, becoming pale violet when withering. All parts of the plant become stained inky-blue if bruised, or on long exposure after gathering. The mode of parasitism is precisely that of *Orobanche*.

Priva leptostachya Juss. (*Streptium asperum* Roxb.). — Pretty frequent about Tissa-maha-rama, South Province. A weedy plant with pure white flowers. Found in the dry districts of Southern India.

Scutellaria spicata Trim., n. sp.

Boerhaavia repanda Willd. — Abundant among the shrubby bushes on the sea-shore at Kirinda, Southern Province, and attractive for its bright pink flowers. A common plant in S. India, and well figured in Wight, 'Icones,' t. 1766. The widely-spread localities of Java, Burmah, Timor, China, and St. Helena are given for this by Choisy.

Suæda maritima Dumat. (*Chenopodina* Moq.), var.—An erect variety with slender ascending branches and very short leafy bracts by the sides of the "lewayas" (salt-pans) at Kirinda, on the east coast, and also at the peninsula of Kalpitiya (Calpentyn), and adjacent islands on the west coast; in both cases along with *S. indica* and *S. nudiflora*. Mr. Hemsley agrees with me in this name. It cannot be the *Chenopodina indica* of Wight, 'Icones,' t. 1793, which has longer leaves and a more branched habit.

Mohlana nemoralis Mart.—This small and slender under-shrub has on two occasions been met with apparently quite wild; at Gonamadde, in Lagulla, an isolated coffee district in the north of the Central Province, and at Uma-oya, an unfrequented low-country district with no cultivation. I have no idea how this Tropical American and African plant obtained so good a footing in Ceylon. Can it be native?

Podostemon algæforme Bedd. (sub *Dicræa*).—Abundant in the Maha-weli River in several places near Kandy, growing with the other species on the rocks, and flowering when the water is low in the dry weather; first collected February, 1881. Our plant is beautifully and exhaustively illustrated by Warming—from specimens sent by me to him—in the 'Vidensk. Selsk. Skr.' 6, ii. t. 12 (1882). Beddome's species is figured in Trans. Linn. Soc. xxv. t. 24, and is sufficiently near the Ceylon plant; Mr. Hemsley, however, doubts complete identity, and thinks our form intermediate between *P. algæforme* and *P. Wallichii* Br.

Ficus Trimeni King MS., n. sp.

F. caudiculata Trim., n. sp.

Curcuma oligantha Trim., n. sp.

Cyanotis arachnoidea Clarke, var. *obtusa* Trim.

C. tuberosa R. & S., var. *ascendens* Dalz. (sp.) (*C. sarmentosa* Wight).—In sandy damp ground near Kirinda, on south-east coast. Readily known from its near allies by its long fusiform fasciculate roots. A plant of Western India, figured in Wight, 'Icones,' t. 2087.

Phœnix pusilla Gaertn. (*P. farinifera* Roxb.).—In the dry forests about Anuradhapura occurs a dwarf *Phœnix* which presents some points of difference from the common species of South Ceylon, *P. zeylanica* Trim. (= *P. sylvestris* Thw., non Roxb.). It forms no stem, the leaf-segments are longer and narrower and less markedly 4-ranked, and the lower spinescent ones longer, slender, and very sharp-pointed, the green is brighter and paler, and the radius rather glaucous. In the female flower the calyx is strongly 3-ribbed, the ribs running out to the end of the strongly-marked teeth. The fruit—which is ripe in April and eaten by the natives—is barely half an inch long, smaller than in *P. zeylanica*, but somewhat broader in proportion to its length, blunt, apiculate, and, when fully ripe, dully-shining purple-black, having passed through bright crimson-scarlet. The figure of *P. pusilla* in Gaertn, 'Fruct.' t. 9, appears to well represent the fruit of our plant; the locality is given as "India orientalis and Ceylona" (p. 24). I believe I am right in placing *P. farinifera* here, at least as understood by the Madras botanists. I saw this wild in Guindy Park, near Madras, but not in fruit. The common yellow-fruited *P. sylvestris* Roxb., so much cultivated in India, does not grow in Ceylon.

Lagenandra insignis Trim., n. sp.

Pandanus Kaida Kurz.—To this I refer a *Pandanus* used abundantly as a fence plant for paddy-fields at Kanuwana and other places near Colombo. The fruit and foliage agree precisely with the excellent old figures of "Kaida" in Rheede, 'Hort. Malabar,' ii. tt. 2–5, on which Kurz founded his species.* I have only seen the female plant, and have never detected any fertilised seed in the fruit, so that it is probable that we have only the one sex here, and that it was originally brought from the Malabar coast. All the species of *Pandanus* are used as fences for paddy, and are always grown from cuttings or branches; they go under the name of "*wetta* (= hedge) *Kayiya*." The syncarps of *P. Kaida* are large, resembling those of *P. dubius* Kurz, 10 or 11 in. long by 6 in. wide, dark dull green becoming dull orange, ovoid-oblong and very blunt, usually solitary, but occasionally with two or three smaller globular lateral ones below; the drupes are very distinct, the free portion of each $\frac{1}{2}$–$\frac{3}{4}$ in. high, rounded and rather flat-topped (bluntly nipple-shaped), with very blunt angles. When young the female flowers are quite separate down to the axis, and each is composed of two or three carpels separated by well-marked grooves; the sessile stigmas are flat, 2-lobed, and slightly reniform. The leaves are broad for the genus, bright green with a glaucous "bloom," and with very strong white spines pointing forward on the margin, and retrorsely hooked on the under surface of the midrib.

Wolffia arrhiza Wimm.—First detected by Mr. W. Ferguson in a pond near Colombo, October, 1880. Occurs in the warm regions of all parts of the globe.

Cymodocea australis Miq. (sub *Halodule*).—In abundance, growing in the shallow water off the shore at Weligama (Belligam) Bay, on the south coast, in December, 1883, along with *C. isoëtifolia* Asch., and *Thalassia Hemprichii* Asch. I could not find any plants in flower. *C. ciliata* Ehrenb., and *C.* (*Phycagrostis*) *serrulata* Asch. & Magn. are both recorded for Ceylon, but I have not, I believe, gathered either on our coasts.†

Eriocaulon fluviatile Trim., n. sp.

Heleocharis multicaulis Sm.—Specimens in the herbarium with the locality "Kurunegula?" appear to belong to this species.

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* See Journ. Asiat. Soc. Beng. 1869, ii., p. 3. In his former paper (Journ. Bot. 1867, p. 127) Rheede's figure was referred to *P. Candelabrum*. Solms ('Linnæa' xlii. p. 59) restricts *P. Kaida* to Siam, and excludes Rheede's figures.

† It may be noted that the three species of marine phanerogams given at p. 333 of Thwaites' 'Enumeratio' are incorrectly determined. *Cymodocea æquorea* (C. P. 2380) is *C. isoëtifolia* Asch.; *Thalassia stipulacea* (C. P. 3055) is *Halophila ovalis* Hk. f.; *Posidonia serrulata* (C. P. 3056) is *Thalassia Hemprichii* Asch.

There is no date to them or collector's name, and no C. P. number was given to them.

Panicum blepharophyllum Trim., n. sp.

Chrysopogon montanus Trim. (*Andropogon monticola* Schultes, *A. montanus* Roxb. ?).—I am informed by Mr. Ridley that this agrees with *A. montanus* Kœn. MS. in the Banksian Herbarium at the British Museum. It was collected by Mr. W. Ferguson between Puttalam and Anuradhapura in 1882. This is a Peninsular Indian species, and Bentham ('Fl. Austral.' vii. p. 538) appears to combine it with the Australian *Holcus parviflorus* Br. (= *Andropogon micranthus* Kunth) under the name of *Chrysopogon parviflorus.*

Anthistiria prostrata Willd. — A common Indian species not noticed in Ceylon till collected by Mr. W. Ferguson near Chilau.

Sporobolus virginicus Kunth (*Agrostis* L.). — This is not an uncommon grass on our sandy sea-shores. I have specimens from Kalpitiya and the small islands off that pensinula, from Chilau, and from Kirinda; it is also common south of Colombo, but does not flower there. A widely-spread species over the warm parts of both hemispheres.

S. humifusus Kunth (*Vilfa* H. B. K.).—In similar places to the last, but less common; its general range is also much the same. Very fine and abundant on Karetivo off Kalpitiya. It is distinguished by its narrow pyramidal rather lax panicles, and the lowest glume being only one-third the length of the second and third.

S. orientalis Kunth (*Agrostis tenacissima* L.). — Abundant about Kirinda and Bundala, on south-east coast, and also at Kalpitiya. It creeps very widely, and, when not in flower, is very liable to be mistaken for *Zoysia pungens*, which often grows with it. Common in Peninsular India.

S. coromandelinus Kunth (*Agrostis* Retz.).—A very pretty little grass, abundant on the sandy coast near Kirinda, but not as yet seen elsewhere. Found also in India and Arabia.

Enteropogon melicoides Nees in Steud. (*Ischæmum* Kœn.).—This fine species was collected in several places near Kirinda. Its range extends to East Tropical Africa (= *Chloris simplex* Schum. & Thorn.), and probably the Mascarene Islands (= ? *Ctenium seychellense* Baker).

Eragrostis (*Harpacline*) *brevifolia* Benth. (*Dactylis* Kœn.).—Probably common in the dry districts. I found it copiously about Hambantota, Tissa-maha-rama, &c. There is also an unnamed specimen in the herbarium here (C. P. 3250) labelled "Jaffra ? Moon." This may represent the *Pommereulla* of Moon's Cat., p. 7, a grass which has not been truly found in Ceylon.

Lepturus repens Br. (*L. aciculatus* Steud.). — Sea-shore south of Colombo, January, 1881; first collected by Mr. W. Ferguson. The plant is abundant in places, and will probably be found, if searched for, in other parts of the south coast. It is the only tropical member of the genus. I find the upper flower of the spikelet frequently perfectly developed; the lowest glume is very long (over half an inch), reaching to the base of the one above on the same side; during flowering it stands out at right angles. At this time the spikes are more or less enclosed in the leaf-sheaths, and have no tendency to break up into joints. The ripe grain is free, but enclosed in the glumes, and held firmly between the excavation in the rachis and the closely adpressed lowest glume; the rachis now readily disarticulates, at points below the origin of each lowest glume, into short joints. I may add that in the upper flowers the lodicules, which are thick, obtuse, or truncate, are evidently attached to the sides of the palea, *i. e.*, stipular; the ovary is very distinctly bifid above.

Teinostachyum? maculatum Trim., n. sp.

Adiantum æthiopicum L. (*A. emarginatum* Bory).—Mr. Ferguson detected this widely distributed fern in abundance above Elgin Estate, in Upper Dimlula, in a locality apparently native. But, as it was also found growing among the coffee of the same estate, and has been for many years a cultivated species in the island, it may be well doubted whether the locality is a truly natural one. Some foreign ferns readily establish themselves in the warm, moist rocky valleys of the coffee districts, and a form of *Gymnogramma peruviana* has become a very abundant plant in many such places with all the look of a native plant.

Ophioglossum lusitanicum L.—I first discovered this as a very minute form growing in the crevices of rocks at Dambulla in December, 1881, during the north-east monsoon rains. This depauperate state is apparently the *O. gramineum* of Willdenow, originally sent from Madras. Specimens lately collected at Uma Oya, on the course of the Maha-weli River, have broader barren fronds, and approach *O. vulgatum*, of which small forms also occur here. The species of this genus seem to have been unduly multiplied.

Isoetes coromandelina L. f. — Collected on Dambulla Hill, 1881. I have given a full account of this as a Ceylon plant, with a figure, in the volume of this Journal for 1881 (pp. 353,[*] t. 234).

A SYNOPSIS OF THE GENUS *SELAGINELLA*.

By J. G. Baker, F.R.S., &c.

(Continued from p. 157.)

[⁂ The following species should be inserted after *S. intertexta* on p. 155.]

257***S. Kirkii**, n. sp.—Stems continuous, trailing, 6–9 in. long, with rootlets from nearly all the nodes; branches short, ascending, with a few short branchlets. Leaves of lower plane very lax on the branches, only the few upper ones of final branchlets contiguous. oblong-lanceolate, acute, bright green, membranous, $\frac{1}{6}$ in. long, rounded on both sides at the base; midrib central; leaves of upper plane a third as long, ascending, oblique oblong-lanceolate. Spikes short; bracts bright green, membranous; larger linear-oblong, ½ line long; smaller ovate, acute.

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[*] A misprint at p. 354, line 4 from bottom, may be corrected here, where "received" should be "second."

Hab. Usagura Mountains, E. Trop. Africa, *Sir J. Kirk.* Habit of *S. fissidentoides.*

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264. **S. heterostachys,** n. sp. — Stems very slender, trailing, 2–4 in. long, pinnate, the branches erecto-patent, the central and lower sometimes considerably compound. Leaves of the lower plane slightly spaced on the branches, very much so on the main stem, spreading, oblique ovate, acute, a line long, pale green, membranous, dilated on the upper side at the base, slightly cordate, serrulate, and a little imbricated over the stem; leaves of the upper plane half as long, broad ovate, with a distinct cusp. Spikes ⅙–¼ in. long, resupinate, ¾–1 lin. diam.; bracts not always distinctly dimorphous, those of the upper plane usually ovate-lanceolate and erecto-patent; of the lower plane ovate, acute, ascending.

Hab. Hong-kong, *C. Wright*! Northern China, *Dr. Hance* 7491!

265. **S. samoensis,** n. sp.— Stems trailing, slender, 3–6 in. long, copiously pinnate, the branches erecto-patent, the lower often copiously compound. Leaves of the lower plane spaced even on the branches, spreading, oblique oblong, obtuse, a line long, bright green, membranous, firmer in texture than in *proniflora*, more produced on the upper side of the midrib, broadly rounded, serrulate, and slightly imbricated over the stem on the upper side at the base; leaves of the upper plane one-third as long, ovate, not cuspidate. Spikes copious, resupinate, ¼–½ in. long, 1 lin. diam.; bracts very dimorphous, those of the upper plane ovate-lanceolate, spreading or erecto-patent, slightly squarrose; those of the lower plane ascending, ovate, cuspidate,

Hab. Samoa, *Powell*! *J. G. Veitch*! *Whitmee*!

266. **S. vitiensis,** n. sp.—Stems slender, trailing, 4–6 in. long, copiously pinnate, the lower branches elongated and copiously compound. Leaves of the lower plane spaced even on the branchlets, spreading, oblong, obtuse, membranous, ¾–1 lin. long, more produced on the upper side of the midrib, broadly rounded and shortly ciliated on the upper side at the base, and very slightly imbricated over the stem; leaves of the upper plane one-third as long, oblong, not cuspidate. Spikes short, resupinate, ½–¾ lin, diam.; bracts of the upper plane ovate-lanceolate, erecto-patent; of the lower plane little shorter, ovate, acute, ascending, strongly keeled.

Hab. Fiji Islands, *Daemel*!

267. S. ALUTACEA Spring Mon. ii. 237. — Stems very slender, trailing, forked low down, copiously pinnate, the branches erecto-patent, the lower copiously compound. Leaves of the lower plane spaced on the main stem, spreading, ovate, subacute, ¾–1 lin. long, bright green, firmer in texture than in *S. proniflora*, very unequal-sided, very cordate, strongly ciliated, and much imbricated over

the stem on the upper side at the base; leaves of the upper plane one-third to one-quarter as long, cordate-ovate, cuspidate. Spikes copious, resupinate, ½–1 in. long, 1 lin. diam., sometimes forked; bracts of the upper plane ovate-lanceolate, acute, very crowded, erecto-patent; bracts of the lower plane ovate-cuspidate, pale, much imbricated.

Var. *sphærophylla* Baker. — Leaves of the lower plane smaller, crowded, suborbicular, firmer in texture, concave on the face. Spikes narrower, with less dimorphic bracts.

Hab. Damp banks on Penang Hill, *Pinwill*! *Maingay* 1831! *Sir W. Norris*!

268. **S. Brackenridgei,** n. sp.—*S. ciliaris* Bracken., non Spring. —Stems decumbent, slender, terete, 3–4 in. long, bisulcate down the face, copiously pinnate, the ascending branches considerably compound. Leaves of the lower plane contiguous on the branches, spaced on the main stem, spreading, oblique oblong, obtuse, ¾–1 lin. long, pale green, membranous in texture but firmer than in *S. proniflora*, unequal-sided, cordate, shortly ciliated, and much imbricated over the stem on the upper side at the base; leaves of the upper plane half as long, ovate, shortly cuspidate. Spikes copious, resupinate, ¼ in. long, ¾ lin. diam.; bracts of the upper plane erecto-patent, oblique ovate-lanceolate; of the lower plane shorter, ovate, acute, pale, ascending, strongly keeled.

Hab. Fiji, behind the town of Muthuata, *Brackenridge*! *Daemel* 191! Intermediate in habit between *serpens* and *proniflora*.

269. **S. boninensis,** n. sp. — Stems trailing, very slender, 2–3 in. long, copiously pinnate, all the branches short and simple. Leaves of the lower plane slightly spaced on the stem, spreading, oblong or oblong-lanceolate, acute, a line long, pale green, membranous, unequal-sided, denticulate, not distinctly ciliated on the upper edge, cordate on the upper side at the base, and imbricated over the stem; leaves of the upper plane half as long, ovate-lanceolate, cuspidate. Spikes short, resupinate, ⅛ in. diam.; bracts of the upper plane crowded, lanceolate, erecto-patent, a line long; of the lower plane ovate-lanceolate, ascending.

Hab. Bonin Islands, *Wright* 371! Resembles *S. integerrima* in its habit and leaves. It is the Bonin plant referred by Spring to *S. pallida*.

270. **S. zeylanica,** n. sp. — Habit of *S. integerrima*. Stems slender, trailing, intermatted, 2–3 in. long, forked low down, sparingly pinnate. Leaves of the lower plane spaced on the main stem, spreading, oblique ovate, acute, a line long, pale green, membranous, very unequal-sided, very cordate, minutely ciliated, and imbricated over the stem on the upper side at the base; leaves of the upper plane one-third as long, cordate-ovate, distinctly cuspidate. Spikes resupinate, ¼–½ in. long, 1 lin. diam.; bracts of the upper plane ovate, imbricated, erecto-patent; of the lower plane ovate-cuspidate, ascending, yellowish.

Hab. Ceylon, *Gardner*! Differs from *S. integerrima* by its distinctly dimorphous bracts and cuspidate leaves of the upper plane.

271. **S. Ottonis,** n. sp. — Stems slender, entirely trailing, 2–3 in. long, distantly pinnate, some of the short branches with 3–4 erecto-patent branchlets. Leaves of the lower plane close and ascending on the branches, rather spaced and spreading on the main stem, oblique ovate, acute, ½ lin. long, pale green, membranous, ciliated all down the upper edge, very cordate, and much imbricated over the stem on the upper side at the base; leaves of the upper plane half as long, broad ovate, cuspidate, shortly ciliated. Spikes short, resupinate, ¾ lin. diam.; bracts of the lower plane oblique ovate-lanceolate, erecto-patent; of the upper plane ovate-cuspidate, yellowish, ascending, strongly ciliated.

Hab. Cuba, *Otto* 231!

272. **S. consimilis,** n. sp. — Stems very slender, trailing, intermatted, 3–4 in. long, distantly pinnate, the branches short and simple. Leaves of the lower plane spaced, spreading, oblong-lanceolate, acute, a line long, pale green, very thin, nearly equal-sided, obscurely ciliated on both sides at the base, broadly rounded on the upper, and scarcely at all imbricated over the stem; leaves of the upper plane half as long, ovate-lanceolate, acuminate. Spikes short, copious, resupinate, ⅛ in. diam.; bracts slightly dimorphic, those of the upper plane ovate-lanceolate, acuminate, erecto-patent, a line long; those of the lower plane smaller, paler, more ascending.

Hab. Cuba, *Wright* 3907! General habit very like that of *S. apus* and *brasiliensis.*

273. S. CORDIFOLIA Spring Mon. ii. 103. — *S. cordata* Klotzsch. — *Lycopodium cordifolium* Desv. — General habit and branching of *S. serpens*, the trailing stem reaching a foot long, the short branches often excurrent and whip-like at the tip, the lower copiously compound. Leaves of the lower plane contiguous on the branches, spaced on the main stem, ovate-lanceolate, very acute, pale green, membranous, above a line long, ciliated on the upper edge, dilated and subcordate, and imbricated over the stem on the upper side at the base; leaves of the upper plane much smaller, ovate-lanceolate, cuspidate. Spikes very short, resupinate, with dimorphous bracts.

Hab. San Domingo and Porto Rico. I have not seen this, and place it amongst the platystachyoid species on A. Braun's authority.

Group III.—BRACHYSTACHYÆ.

274. S. BRACHYSTACHYA Spring Mon. ii. 255. — *Lycopodium brachystachyum* Hook. & Grev. — Stems reaching a foot or more in length, generally assurgent from a decumbent base, bisulcate down the face, copiously compound, the final branching midway between pinnate and flabellate. Leaves of the lower plane contiguous on the branchlets, spaced on the main stem, spreading or rather ascending, oblong-rhomboid, obtuse, one-sixth to one-fifth in. long, dilated on the upper side at the base, cordate, not ciliated, much imbricated over the stem; leaves of the upper plane small, ovate, with a cusp as long as the lamina. Spikes resupinate, ¼–½ in. long, ⅛ in. diam.; bracts of the upper plane oblique lanceolate, erecto-patent; of the lower plane ovate-lanceolate, ascending,

Var. S. ORNATA Spring Mon. ii. 259.—*S. fimbriata* Spring Mon. ii. 258.—*Lycopodium ornatum* Hook. & Grev.— Stem erect from the base. Leaves smaller, more rigid and more ascending. Spikes longer and narrower, ½–1 in. long, with less distinctly dimorphous bracts.

Hab. Khasia Mountains, Malay Islands, Ceylon and Mauritius.

275. **S. megaphylla**, n. sp.— Stems ½–1 ft. long, assurgent from a decumbent base, with very long root-fibres, the branches copiously compound, deeply sulcate down on the face. Leaves of the lower plane contiguous except low down the stem, patent from an oblique base, linear-oblong, obtuse, ⅙–¼ in. long, 3–4 times as long as broad, bright green, moderately firm in texture, serrulate, rounded and a little imbricated over the stem on the upper side at the base; leaves of the upper ovate-lanceolate, cuspidate. Spikes short, resupinate, ⅛ in. diameter; bracts of the upper plane lanceolate-acuminate, rigidly erecto-patent; of the lower paler, rather shorter, more ascending.

Hab. Mishmi, East Himalayas, *Griffith*!

276. **S. squarrosa**, n. sp.— Stems about a foot long, trailing and sending out copious root-fibres in the lower half, assurgent, deeply bisulcate down the face, copiously pinnate, the branches copiously compound. Leaves of the lower plane spreading and contiguous on the branches, spaced and rather squarrose on the main stem, oblong-rhomboid, subacute at the upper corner, one-sixth to one-fifth in. long, bright green, moderately firm in texture, not ciliated, dilated, cordate and much imbricated over the stem on the upper side at the base; leaves of the upper plane small, ovate, with a cusp as long as the lamina. Spikes short, resupinate, ⅛ in. diam.; bracts of the upper plane lanceolate, spreading, squarrose; of the lower plane ovate cuspidate, ascending.

Hab. Cameroon Mountains, alt. 4000 feet, *Mann* 1407! Sierra de Crystal, *Mann* 1638!

277. **S. Mannii**, n. sp. — Stems ½–1 ft. long, assurgent from a decumbent base, from which arise several large stout root-fibres, bisulcate down the face, closely pinnate, the erecto-patent branches copiously compound. Leaves of the lower plane contiguous on the branches, rather spaced on the main stem, ascending, ovate- or oblong-rhomboid, subacute at the upper corner, ⅛–⅙ in. long, bright green, firm in texture, dilated, shortly ciliated, cordate, and much imbricated over the stem on the upper side at the base; leaves of the upper plane half as long, ovate-cuspidate. Spikes ¼–½ in. long, 1 lin. diam., resupinate; bracts of the upper plane ovate-lanceolate, rigidly erecto-patent; of the lower plane shorter, ovate-cuspidate, more ascending, ventricose, acutely keeled.

Hab. Island of St. Thomas, West Tropical Africa, alt. 5000 ft., *Mann* 1108!

(To be continued.)

SOME MORE NOTES ON DOVEDALE PLANTS.

By the Rev. W. H. Purchas.

The remarks of Messrs. Baker and Newbould in their interesting "Notes on the Flora of Matlock" (Journ. Bot., Nov., 1884), as to the absence of certain species from Dovedale and the immediate neighbourhood, give me the opportunity of making a few comments by way of additions to, or in confirmation of, their statements, which I might not otherwise have judged it worth while to set down; and whilst doing this I will further take occasion to record such few additions as I have latterly made to the Derbyshire list of species, together with some more localities for those already recorded.

It was a matter of much regret to me that the stay of Mr. Baker and his friends at Matlock, and more especially their visit to Dovedale, should have occurred at a time when I was absent from home, and that I thus missed the pleasure and advantage of meeting them. I can only hope to be more fortunate should their visit be repeated, as I trust it may be.

A residence of over fourteen years within a mile and a half of the upper end of Dovedale (although actually in Staffordshire) will necessarily have given me the opportunity of visiting this celebrated Derbyshire Dale at all times of the year and during a succession of seasons, some of which have been more favourable than others to the appearance of certain plants, and thus of becoming acquainted with stations of plants which would scarcely be met with in a single visit.

I have not, indeed, recorded all the common species on the Derbyshire side of the valley of the Dove with the same care with which I have those of the Staffordshire side, on which I am living, but I have carfully noted the more uncommon ones as I have found them. The present paper will only have reference to such species as seem to call for some comment, or for which the mention of additional localities or further statements as to their occurrence and conditions of growth seems desirable.

Like Mr. Baker, I have been much struck with the absence of many species from Dovedale and its immediate neighbourhood, more especially of such as occur freely in the valley of the Wye between Buxton and Matlock. *Thalictrum montanum*, *Myosotis palustris*, and *Geranium sanguineum* are examples.

The scanty clothing of soil on the steep rocky slopes of Dovedale makes it difficult for plants to withstand the effects of drought, especially on the more sunny Derbyshire side, which is less clothed with wood or scrub than the Staffordshire side. To this cause I attribute the absence of some species. I was informed on good authority that *Polypodium robertianum*, &c., grew in some quantity on one of the exposed stony slopes, but that it disappeared after the hot dry summers of 1868–70. Certain it is that it has not since been to be found on the Derbyshire side, although existing in very small quantity on the Staffordshire side of the Dale.

The drought of those seasons and then the continued heavy rains of a series of subsequent years, by washing away the earth from the crevices of the rocks, may have destroyed some other species, such as *Cotyledon*, which, although recorded by the late Mr. Edwin Brown in Sir O. Mosley's Nat. Hist. of Tutbury as growing in Dovedale, do not seem now to exist there. Other species, more especially ferns, have been almost absolutely exterminated by the ravages of dealers and thoughtless tourists. Such is the case with *Ceterach officinarum*, which, I learn on good authority, was at one time plentiful.

Of Batrachian *Ranunculi*, aggregate *R. peltatus* seems to be the form which occurs in the pools, chiefly artificial, which are scattered over the limestone plateau which separates the valleys of the Dove and Wye.—A doubtful form tending towards *R. floribundus* was noticed by Mr. C. Bailey and myself between Pike Hall and Grange Mill. — *R. Drouettii* occurs in great abundance in the ponds and reservoirs of the Via Gellia. I have noticed it for a succession of seasons, but I think it was unusually abundant last summer.—*R. penicillatus* occurs abundantly in the Dove, as has been recorded, from Beresford Dale downwards. I have sought in vain, season after season, for even a partially-matured carpel. — *R. fluitans*, at least in the Herefordshire Wye, matures fruit freely.

Corydalis claviculata still grows on some of the millstone-grit rocks near Birchover.

Hutchinsia petræa. I only notice this to remark that it has become much less abundant in Dovedale than it was some ten or fifteen years ago. It is curious that my Herefordshire botanical friends have observed the same thing in their district. Perhaps the seasons may have in some way been unfavourable, so that we may expect it again to become more abundant.

Cardamine amara is plentiful in various parts of the Dove.

I have failed to find *Arabis perfoliata* in the station indicated for it in N. B. G., namely, between Ashbourne and Okeover; but it is a likely part, from soil and situation.

The absence of *Thlaspi virens* and its usual ally, *Arenaria verna*, from all the mine-hillocks which I have examined on both sides of Dovedale is remarkable, when we consider how freely they occur in the neighbourhood of Matlock.

Viola Reichenbachiana (first record for the county) occurs plentifully at Fenny Bentley, extending for perhaps half a mile and then giving place to *V. Riviniana*. *V. Reichenbachiana* begins to flower several weeks sooner than *V. Riviniana*. A difference in the form and texture of the leaves enables the eye to distinguish these, even without the aid of the flowers, in the early part of the season; but as summer advances the distinction becomes less obvious, and the difference in the sepals has to be called in. *V. canina* ("Linn") Bab. seems to be a scarce plant in Derbyshire. I have only met with a few plants of it in one part of Dovedale; these were of the larger form, and the colour of the petals was more inclining to purple than I have elsewhere seen them; but the species not to be mistaken. — *V. lutea*, which occurs in some plenty on some of the limestone hills of the Staffordshire side of Dovedale, seems nearly or quite absent from those on the Derbyshire side. In general it shows a preference for sandstone; and the Ordnance Geological Survey Surveyors report that they often obtained help in detecting the boundary between the shales and the sandstone by the presence of *V. lutea*, "a crowded belt of which, perhaps not many yards broad, is often seen along the outcrop of a sandstone-bed, whilst not a single plant will be found on the shales which come out on either side" (Mem. of Geol. Survey N. Derbyshire, p. 4).

Alsine tenuifolia used to occur on one of the rocky banks near the path-side in Dovedale. In the summer of 1879, however, on looking for it as usual when I passed, I found that every one of the plants which I had noticed not long before had been taken away by some ruthless and inconsiderate plant-collector. Since that time it has never reappeared. It is greatly to be wished that such collectors would bear in mind that they not only deprive everyone else, but themselves also, of the pleasure of gathering the plant again. I am glad to say that there is another station at Brassington, some few miles to the east.

Stellaria media, var. *umbrosa*, Opitz. Hedge-bank at Fenny Bentley, and near the railway-station at Ashbourne.

Hypericum montanum occurs, but not in great quantity. I do not think I have ever seen *H. humifusum* on limestone, and I suspect that a starved state of *H. perforatum* was mistaken for it in Dovedale.

The *Malva* growing on Thorpe Cloud is *M. sylvestris*, not *M. rotundifolia*, which seems absent from the district.

Tilia? There are one or two scrubby bushes of either *T. grandifolia* or *intermedia*—it would not be safe to say which—at an elevation of over 1000 ft. on one of the cliffs of Dovedale. It is difficult to suppose it other than wild.

Euonymus europæus. Dovedale, in very small quantity, and overlooked until a member of my family detected it last summer.

Geranium sanguineum. I have seen one weakly root of this on a rock north of Hartington.

Ulex Gallii, although preferring gritstone, is not excluded from parts of the limestone banks.

Sarothamnus. Wholly absent from the limestone; appears on the millstone grit at Birchover, about the curious rocks called Robin Hood's Stride, and Cratcliff Tor.

Trifolium fragiferum. Side of the road between Fenny Bentley and Tissington.

Ononis arvensis. Near a quarry on Hollington End, near Thorpe, and also in the Via Gellia.

Prunus Padus. In some quantity on a stony slope near the upper end of Dovedale, and also by the brook at Fenny Bentley.

Of *Rubi*, Mr. Baker notices the absence of suberect forms from the limestone. — *R. fissus*, the only one of that group which I have yet met with anywhere in this neighbourhood, occurs on the New

Red Sandstone at Bradley Wood, a heathy wood on the hillside 1½ mile E. of Ashbourne, and I know of no station for it between that spot and the Staffordshire moorland district N. of this village. —In the hedges near Bradley Wood occurs *R. Lindleianus* in great plenty; and very sparingly *R. umbrosus*, which, like *R. fissus*, is a plant of the Staffordshire moorland, and, with it, skips over the intervening limestone district to appear on the sandstone E. of Ashbourne. The country to the south and east of Ashbourne seems to possess a fair list of brambles; but as I have had very few opportunities of investigating them, and as one or two of those which I have met with are not satisfactorily determined, I refrain from mentioning more than those, to whose absence from the limestone tracts Mr. Baker has called attention. *R. discolor*. Tissington and Dovedale, where this was seen by Mr. Baker, are its chief quarters hereabout. I think I am safe in saying that, from that part of the Ashbourne and Buxton road where it was crossed by Mr. Baker and his friends on their way to Dovedale, the remaining fourteen or more miles of the distance to Buxton would only have shown them one other bush of it. *R. discolor* is a late-flowering species, and very rarely ripens its fruit hereabout. It was killed down by some of our recent severe winters, whilst *R. pallidus* seemed unaffected by the cold. Ascends to about 900 ft. near New Inns Farmhouse. — *R. ramosus* Bloxam! Between Youlgrave and Robin Hood's Stride. A much more prickly bramble than Mr. Briggs's Devonshire *ramosus*, and I should have hesitated to think that they could be the same; but my plant (and I believe Mr. Briggs's also) were named by Mr. Bloxam himself. I have also found the same plant a mile or two N.W. of Hartington. — *R. amplificatus* Lees. Rare; one bush at Sandy Brook, near Ashbourne, seems to be this, although abnormal. *R. Radula*. Mr. Bloxam did not regard the form which occurs in Dovedale and in other places in this neighbourhood as typical *Radula*, but rather as *R. melanoxylon* Müll.; Prof. Babington named it *Radula*. — *R. pallidus* Weihe seems to occur equally on limestone and gritstone, and ascends considerably higher than *R. discolor*. — *R. dumetorum*, var. *intensus*, Warren. Occurs in the hedges between Parwich and Alsop-en-le-dale; verified by Bloxam. A slender form with remarkably narrow leaves belonging to the *dumetorum* group occurs in Dovedale, near the rock called "Pickering Tors." Well-marked *R. cæsius*, var. *pseudo-idæus*, occurs in one of the limestone woods of the Via Gellia, called Griff Wood; also by the roadside near Hipley Rock, between Tissington and the High Peak Railway.

Rosa micrantha has not, I think, been recorded for Derbyshire. It occurs a mile or two from Ashbourne, on the Derby Road.— *R. cæsia* occurs sparingly in Dovedale, but, growing in shade, is easily overlooked when out of flower.

(To be continued.)

SHORT NOTES.

Crocus Korolokowi in Afghanistan. — This rare Crocus has been recently obtained by Mr. W. Simpson, in his travels in Afghanistan. He collected a few specimens at Bala Murghab, on the level ground of the valley, 63° E. long. and between 35° and 36° N. lat., where he found the plant growing in great quantities. This extends its range further east, as Mr. Maw gives its distribution as between 40° and 45° N. lat. and 67° and 71° long., mentioning it as the most eastern of the yellow species. His specimens were received from Prof. Regel, without any record of date, but from their characters he inferred them to be vernal species. This inference is proved correct by Mr. Simpson, who states that the specimens sent by him to the British Museum were collected at the end of January or beginning of February. He states that the leaves have in the fresh state a row of pale spots along each margin, forming a most delicate and beautiful border. This, however, has disappeared in the dried plants.—H. N. Ridley.

Unusual form of attempted Conjugation in Spirogyra.—Early in May, while examining some *Spirogyra* in a vigorous state of growth and conjugation, I observed an appearance which is perhaps sufficiently remarkable to deserve mention. Two filaments lay parallel, and several cells of one were connected with the cells in the other opposite to them by the usual processes, but communication was not yet established between the two cells. So far all was regular, but the peculiarity occurred in one case. Let us call one pair of cells *a* and *a′*; and let the cell adjoining *a* in its filament be *b*, and *b′* be opposite to *b* in the other filament, and therefore adjacent to *a′*. It was seen that *b′* had failed to send out a process, but *b* had sent out two. One, situated near the end of *b* remote from *a*, was short but straight: the other protruded from a part of *b* near to *a;* it proceeded straight for some distance, and then turned sharply round at right angles, until it reached the junction of the two processes prom *a* and *a′*, both of which processes it seemed to touch. It was impossible to feel sure that the contact in both cases was more than optical: a triangle was seen, bounded by the walls of the three processes. But it would seem beyond doubt that the process from *b*, disappointed as it were in finding no response from its infertile neighbour *b′*, was led to turn aside by the joint or separate influence ot *a* and *a′*. I regret that I found it impossible to keep the filaments alive. It would have been interesting to see what fructification would have resulted.—Sylvanus J. Hunter, S. J.

Nitella capitata Ag. in Cambridgeshire.—We have received from Mr. Alfred Fryer specimens of this species, collected in May, 1885, in one of the ditches in "The Washes." These are the first satisfactory specimens we have seen from Britain, although Braun has referred plants from Kent, Anglesea and Kerry to this species. We hope to give a full description and figure in a subsequent number. In the living plant the mucilaginous covering of the nucules and globules may be readily seen, or indeed may be felt, and this at once distinguishes it from *N. opaca.*—H. & J. GROVES.

NOTICES OF BOOKS.

Die Pilz thiere oder Schleimpilze. Von Dr. W. ZOPF. [Encyclopædie der Naturwissenschaften. Breslau, Eduard Trewendt, 1885].

OWING to the advances made in our knowledge of the Mycetozoa since De Bary's remarkable work (1864), and also to the fact that Rostafinski's Monograph of the group is written in Polish, and thus inaccessible to most botanists, the want has arisen of a treatment of these organisms embodying the scattered results of the last twenty years' work. Dr. M. C. Cooke has given us an extract from Rostafinski's Monograph, so far as it has reference to species found in Great Britain; but the student of the group demands more than such a glimpse into this comprehensive work, and it is to be regretted that the whole Monograph was not then rendered into intelligible language.

In De Bary's 'Vergleichende Morphologie und Biologie der Pilze, Mycetozoen und Bacterien,' published last year, the group received the same treatment as the others in the book, and this had the special interest of being furnished by the author of the work which first threw light upon the life-histories and relationships of these extraordinary organisms.

Dr. Zopf has divided his present treatise into three sections; the first dealing with the Morphology and the second with the Physiology. These parts of the subject are thoroughly dealt with, and of very special interest. De Bary's recent discussion (just referred to) of the same subject perhaps makes one feel less indebted than one should to Dr. Zopf for his painstaking and original labour. The third section, which is perhaps the most valuable, is devoted to the systematic grouping of the Mycetozoa. Dr. Zopf's classification is as follows:—

Division I.—MONADINEÆ.

1. MONADINEÆ AZOOSPOREÆ.
    - Fam. 1. VAMPYRELLACEÆ.
        - Gen. 1. Vampyrellidium.
        - 2. Spirophora.
        - 3. Haplococcus.
        - 4. Vampyrella.
        - 5. Leptophrys.
        - 6. Endyomena.
    - Fam. 2. BURSULLINEÆ.
        - Gen. 1. Bursulla.
    - Fam. 3. MONOCYSTACEÆ.
        - Gen. 1. Myxastrum.
        - 2. Enteromyxa.
2. MONODINEÆ ZOOSPOREÆ.
    - Fam. 1. PSEUDOSPOREÆ.
        - Gen. 1. Colpodella.
        - 2. Pseudospora.
        - 3. Protomonas.
        - 4. Diplophysalis.
    - Fam. 2. GYMNOCOCCACEÆ.
        - Gen. 1. Gymnococcus.
        - 2. Aphelidium.
        - 3. Pseudosporidium.
        - 4. Protomyxa.
    - Fam. 3. PLASMODIOPHOREÆ.
        - Gen. 1. Plasmodiophora.
        - 2. Tetramyxa.

Division II.—Eumycetozoa.

Group I. Sorophoreæ.
  A. Guttulineæ.
    Gen. 1. Copromyxa.
      2. Guttulina.

  B. Dictyosteliaceæ.
    Gen. 1. Dictyostelium.
      2. Acrasis.
      3. Polysphondylium.

Group II. Endosporeæ.
  Ord. I. Peritricheæ.
    Fam. 1. Clathroptychiaceæ.
      Gen. 1. Clathroptychium.
        2. Enteridium.

    Fam. 2. Cribrariaceæ.
      Gen. 1. Dictydium.
        2. Cribraria.

  Ord. II. Endotricheæ.
    Subord. 1. Stereonemeæ.
    I. Calcariaceæ.
      Fam. 1. Physareæ.
        Gen. 1. Physarum.
          2. Craterium.
          3. Badhamia.
          4. Leocarpus.
          5. Tilmadoche.
          6. Fuligo.
          7. Aethaliopsis.

      Fam. 2. Didymiaceæ.
        Gen. 1. Didymium.
          2. Lepidoderma.

      Fam. 3. Spumariaceæ.
        Gen. 1. Spumaria.
          2. Diachea.

    II. Amaurochætaceæ.
      Fam. 1. Stemoniteæ.
        Gen. 1. Stemonitis.
          2. Comatricha.
          3. Lamproderma.

      Fam. 2. Enertheneme æ.
        Gen. 1. Enerthenema.

      Fam. 3. Reticulariaceæ.
        Gen. 1. Amaurochæte.
          2. Reticularia.

    Subord. II. Cœlonemeæ.
      Fam. 1. Trichiaceæ.
        Gen. 1. Hemiarcyria.
          2. Trichia.

      Fam. 2. Arcyriaceæ.
        Gen. 1. Arcyria.
          2. Cornuvia.
          3. Lycogala.

      Fam. 3. Perichænaceæ.
        Gen. 1. Perichæna.
          2. Lachnobolus.

      Fam. 4. Liceaceæ.
        Gen. 1. Licea.
          2. Tubulina.
          3. Tubulifera.

Group. III. Exosporeæ.
  Gen. 1. Ceratium.

It will thus be seen that Dr. Zopf has found it necessary to modify Rostafinski's classification. Following the above order the author goes over the whole series in detail, giving a short, and as a rule very clear, account of each form. Perhaps it should be known that this very comprehensive and well illustrated account of the morphology and physiology, and complete systematic treatment of a group of organisms as interesting as they are obscure, has been produced in handy form at the price of five shillings. G. M.

Die Spaltpilze. Von Dr. W. Zopf. 3rd ed. [Encyclopædie der Naturwissenschaften. Breslau, Eduard Trewendt. 1885].

Any contribution to the literature of this subject made by an author educated in Botany is pretty sure to be distinguishable at once from the work of a pathologist. The one recognises throughout that the organisms he treats of are plants more or less like certain allies; while the other apparently regards them as a set of objects by themselves, to be classified in peculiar ways and after no botanically acceptable fashion. No doubt our ignorance of the life-histories of the *Schizomycetes* stands in the way of a satisfactory botanical classification, but that is decidedly no reason for adopting bases of arrangement which have been long discharged from service in Botany. Dr. Zopf has divided his book into four sections, dealing with the morphology, physiology, methods of investigation, and systematic arrangement respectively. He divides the group thus:—

- I. COCCACEÆ
  - Gen. 1. Streptococcus.
  - 2. Merismopedia.
  - 3. Sarcina.
  - 4. Micrococcus.
  - 5. Ascococcus.
- II. BACTERIACEÆ.
  - Gen. 1. Bacterium.
  - 2. Spirillum.
  - 3. Leuconostoc.
  - 4. Bacillus.
  - Gen. 5. Vibrio.
  - 6. Clostridium.
- III. LEPTOTRICHEÆ.
  - Gen. 1. Crenothrix.
  - 2. Beggiatoa.
  - 3. Phragmidiothrix.
  - 4. Leptothrix.
- IV. CLADOTRICHEÆ.
  - Gen. 1. Cladothrix.

The author, who, by the way, accepts the *Spirillum Choleræ Asiaticæ* (which is doubtless the defeated comma-shaped *Bacillus* of Koch's researches), deals concisely with the pathological literature. The book is clearly written, and excellently illustrated. A very useful catalogue of the literature of the subject is to be found at the end. G. M.

Die Methoden der Bacterien-Forschung. Von Dr. FERDINAND HUEPPE. (Kreidel. Wiesbaden, 1885).

DR. HUEPPE, who is a pupil of Dr. Koch's, has gathered together into a handy form a very useful body of information on the subject of the methods of investigating Bacteria. Much of this information has been collected from sources difficult of access, and the whole has been judiciously arranged by the author, who shows a wide and intimate knowledge of the methods in use. The methods of staining and cultivating, the principles of sterilization, the relation of Bacteria to decomposition and to disease are very fully discussed, as well as the general Biology of the group. The illustrations of apparatus, &c., are a useful feature of the book. The author has done excellent service in not only gathering together, but in selecting the materials for a book which is sure to be welcome among students of the important group of *Schizomycetes*. G. M.

Text-book of General Botany. By Dr. W. J. BEHRENS. Translation from the second German edition revised by PATRICK GEDDES, F.R.S.E. [Pentland, Edinburgh, 1885].

A Course of Practical Instruction in Botany. Part I. By F. O. BOWER and S. H. VINES. (London, Macmillan & Co., 1885).

FEW German text-books of Botany better deserve translation than Behrens', and very few have been better translated. Miss Harris Smith and Mr. Geddes are to be sincerely congratulated on the production of it. The arrangement of the book is a novel one, and no doubt this attracted those who are responsible for its appearance quite as much as its other merits. The arrangement is as follows:—Part I. deals with Morphology; the root, stem, leaves (flower, fruit, seed), and hairs at considerable length. Part II. is devoted to Systematic Botany, the higher plants only, (1) Monocotyledons and (2) Dicotyledons being dealt with in detail. Part III. is occupied with an admirable account of fertilisation by wind and by insects, and the transport of seeds, &c., by water, wind, and animals. Part IV. contains Anatomy (the cell and the tissues) and Physiology. In Part V. we come again to Systematic Botany, beginning with the lowest plants (for which the student has been prepared by Part IV.) and ascending to the higher plants again—the groups being dealt with very shortly.

It will be obvious that the learner is thus gradually introduced to the more difficult branches of the study—and this, I venture to think, might have been better done by going steadily down from the highest to the lowest plants. With this exception and the farther one, that the reviser might with advantage have taken liberties with the classification so as to bring it out of the German land of darkness in systematic affairs, the book is wholly to be recommended. It will be specially serviceable to those who study Botany at their leisure away from classes of instruction, and the regular student will certainly find it a pleasant introduction as well as a thorough one to all branches of the science. In spite of its being a translation, it is by far the most readable text-book of its kind that we have, and decidedly it is the best-illustrated.

The first part of Messrs. Bower and Vines' Practical Botany is a valuable addition to our literature in these days, when a new departure has been taken in the methods of teaching Botany in this country. The book is, as its name sets forth, very practical, and very well fitted for its purpose. G. M.

A Flora of the English Lake District. By J. G. Baker, F.R.S. London: Bell & Sons, 1885. 8vo, pp. vi. 262.

The English Lake district presents so many features of interest to the botanist that it is somewhat strange there should have been hitherto no connected account of its Flora. "A mountainous tract with a distinct physical individuality of its own, and with a distinct botanical individuality, both in respect of the plants that are present and those that are rare or absent,"—we quote from Mr. Baker's preface,—it does not correspond exactly with Mr. Watson's Lake Province, the district included "extending northward and eastward to Allonby, Wigton, Penrith, and Tebay," but excluding "the low-lying northern half of Cumberland, often called the Plain of Carlisle, and the western slope of the Pennine Chain through Cumberland and Westmoreland."

It would be impertinent to attempt a detailed criticism of a flora of this kind unless the critic had himself an intimate acquaintance with the district to which it pertains; and such an acquaintance cannot be claimed by one whose visits to the Lake Country have been as "few and far between" as those of the present writer. But it may be well, in drawing attention to this welcome addition to our local floras,—which fortunately appears in good time for use during the present season,—to point out that it differs materially from works of the same kind in its mode of treatment. Instead of the elaborate system of more or less numerous districts and sub-districts which have found favour with recent workers, Mr. Baker summarises the distribution of each plant in a manner which at first sight strikes the reader as somewhat superficial. But it is only at first sight that such a view can be entertained. Mr. Baker's knowledge and experience as a field botanist, a herbarium student, and a practised botanical author, have enabled him to condense his information in a manner which, we think, few could successfully imitate. His "leading purpose," as Mr. Watson said of his 'Topographical Botany,' "is to adduce and arrange personal testimony in a very condensed form"; and he has succeeded in this without losing, as far as we are able to judge, any important details. The generalising faculty here displayed, evident in the various monographs with which the author has enriched contemporary botanical literature, has always seemed to us one of Mr. Baker's strongest points, the only disadvantage connected with it being that those possessed of less intimate acquaintance with their district may be led to attempt to generalise from insufficient data concerning the plants of their neighbourhood.

The Flora of the Lake district is intended by its author as a field book, rather than as a volume for the study; and to this must be attributed the comparative absence of such notes on the life-history of the plants recorded, which made Mr. Briggs' 'Flora of Plymouth' improving and instructive reading even to those who were quite unacquainted with Devonshire botany. Not that even these are altogether wanting; while the topographical and bibliographical introduction is excellently done. This inadequate notice will, we hope, draw the attention of our readers to a work which is indispensable to the students of English plants.

The recently published part of the 'Transactions of the Botanical Society of Edinburgh' (xvi. pt. I.) contains obituary notices of George Dickie, Richard Parnell and G. H. K. Thwaites, Oswald Heer, J. L. Paterson, T. H. Corry, and John Sadler; with papers on '*Rubus Leesii* and Inverness plants,' by Dr. Mactier; 'proliferous first fronds of seedling British Ferns,' by C. T. Druery; 'Flora of Berwickshire,' by C. Stuart and G. Macfarlane; 'the affinities of the genus *Pothocites*,' by R Kidston; 'the multinucleated condition of the Vegetable Cell,' by A. E. Grant; 'on Coal incrusting large Pinaceous Fossil Stems,' by A. Taylor; 'on a divarication of the Primrose,' by C. Howie; 'an abnormal form of *Listera cordata*, and localities for Cornish plants,' by T. H. Corry;' 'a Type Botanic Garden,' by P. Geddes; 'Statistics of Topographical Botany in Scotland,' by S. Grieve; 'half-hardy plants on the Coast of Arran,' by D. Landsborough; 'the May

Island,' 'the Algæ of Granton Quarry,' and 'the oil-bodies of *Jungermanniæ*,' by J. Rattray; 'the germination of *Podophyllum*, and the occurrence of foliage-leaves in *Ruscus androgynus*,' by A. Dickson.

The 'Proceedings of the Holmesdale Natural History Club' for 1882–83 have lately been issued. There is a list of localities of rare Surrey plants by Mr. W. H. Summers; and a record of a new locality on Reigate Heath for *Narthecium Ossifragum*, to which "it was afterwards ascertained that the plant had been introduced some years ago by Mr. N. G. Brown, of Kew." We reproduce the statement in order that so misleading a practice may do as little harm as possible.

We have received 'Tree Gossip,' by Mr. F. G. Heath, published by Field & Tuer, Leadenhall Press, E.C. It is beautifully printed.

New Books. — A. N. Berlese, 'Fungi Moricolæ: iconografia e descrizione dei Funghi parassiti der Gelso' (Padua, Salmin: 5 lire: 8vo: fasc. 1, 10 coloured plates).—E. M. Cosgrave, 'The Student's Botany' (Dublin, Fannin, 2*s.* 6*d.*: 8vo, pp. 95). — J. Revel, 'Essai de la Flore du Sudouest de la France' (Paris, Savi, 5 *fr.*: 8vo, pt. 1 (*Ranunculaceæ—Compositæ*), pp. 431: 1 plate). — G. de Saporta & A. F. Marion, 'L'Évolution du Règne Végétal' (Phanérogames), (2 vols. 8vo, pp. x. 251, 248: 136 cuts: Paris, Alcan). — W. J. Behrens, 'Text-book of General Botany,' edited by P. Geddes (Edinburgh, Pentland: 8vo, pp. viii. 374: 408 cuts). — A. W. Thomé, 'Flora von Deutschland Oesterreich und der Schweiz für Schule und Haus' (Gera-Untermhaus, Köhler: 8vo, 1st pt. (1 mark), pp. 32, tt. 16). — H. Schulz, 'Die Officinellen Pflanzen und Pflanzenpräparate' (Wiesbaden, Bergmann: 8vo, pp. 176, 94 cuts). — G. Hieronymus, 'Ueber *Rafflesia Schadenbergiana*' (Breslau: 4to, pp. 10, 2 plates). — A. Mangin, 'Les Botanistes Lyonnais.—I. Claret de la Tourette' (1729–1793), (Paris, Baillière: 8vo, pp. 236). — H. van Heurck, 'Synopsis des Diatomées de Belgique' (Anvers: 8vo, pp. 235: text, with 3 supplementary plates).

Articles in Journals.

American Naturalist. — E. L. Sturtevant, 'Kitchen-garden Esculents of American Origin.' — A. A. Crozier, 'Node of *Equisetum*.' — A. G. Foerste, 'Fertilisation of *Cuphea viscosissima*.'

Botanical Gazette (April). — A. W. Chapman, '*Torreya taxifolia*' (with map). — T. Morong, 'Notes on *Naiadaceæ*.' — W. Trelease, 'Biology of the *Conjugatæ*.' — G. Vasey, 'New Grasses' (*Elymus Orcuttianus*, *Agropyrum tenerum*, spp. nn.). — E. L. Sturtevant, 'Lowest Germination of Maize.'

Botaniska Notiser (Haft 3). — S. Murbeck, 'Några anteckningar till floram på Norges sydvestra och södra Kust.' — C. Jensen, *Fontinalis longifolia*, n. sp. — L. M. Neuman, 'Anteckningar angående Rubus-floran i nordvestra Skåne, på Hallandsås och i södra Halland.' — E. Ljungström, 'Två Rumexhybrider, tagna på Bornholm' (*Rumex crispus* & *sanguineus*, & *R. conglomeratus* & *obtusifolius*). — G. Andersson, 'Några ord om Linnés *Stipa pennata*.'

Bot. Centralblatt (Nos. 18–20).—. Poleck, 'Ueber gehungene Cultur-Versuche des Hausschwamns, Merulius lacrymans aus sporen.' —(No. 21). A. Hausgrirg, 'Ueber den Polymorphisaurs der Algen.'

Bot. Zeitung (April 24, May, 1, 8). — E. Zacharias, 'Ueber den Nucleolus.' — (May 15). M. W. Beyernick, 'Die Galle von *Cecidomyia Poæ* an *Poa nemoralis*' (1 plate).

Bull. Bot. Soc. France (xxxii. Comptes Rendus 3).—(May 2). P. van Tieghem, 'Valeur Morphologique des cellules annelées et spiralées des Cactées. — E. Heckel, 'Origine botanique des Doundakés d'Afrique.' — J. Constantin & L. Dufour, 'Contributions à l'étude de la tige des Lécythidées.' — E. Bornet & C. Flahault, 'Sur le genre Aulosira' (1 plate: *A. implexa*, sp. n.). — D. Clos, 'D'un nouveau caractère distinctif des *Anagallis phœnicea & cærulea.*' — J. Vallot, 'Flore glaciale des Hautes-Pyrénées.' — E. Mer, 'Sur un Sapin de 25 ans dépourvu de branches.' — A. Battandier, 'Deux Amaryllidées nouvelles pour la flore de l'Algérie.'

Flora (April 1). — M. Ebeling, 'Die Saugorganes bei der Keimung endospermhaltiger Samen.' — F. W. Klatt, 'Compositæ novæ ex herb. Haskarl' (*Eupatorium Ehrenbergii*, *Jaumea alternifolia*, *Pharetranthus* (gen. nov.) *ferrugineus*, *Gongrothamnus multiflorus*, spp. nn.). — (April 11). F. Arnold, 'Die Lichenen des fränkischen Jura.' — (April 21). J. Müller, 'Lichenologische Beiträge.' — (May 1). H. Fischer, 'Zur vergleichenden Anatomie des Markstrahlgewebes und der jährlichen Zuwachszonen im Holzkörper von Stamm, Wurzel & Aesten bei *Pinus Abies*' (1 plate).

Gardeners' Chronicle (May 9).—[M. T. Masters] 'Orchids double and single' (figs. 108–112).—Id., 'Leaf-structure of Orchids' (figs. 115–120).—F. W. Burbidge, 'Geographical Distribution of Orchids' (with map).—(May 6). H. G. Reichenbach, 'Proliferous Roots of Orchids'; 'Three-lipped Orchids'; '*Luddemannia Pescatorei.*'— H. T. Veitch, 'Hybridisation of Orchids' (figs. 121–142). — (May 23). *Anchomanes dubius* (figs. 151, 152).

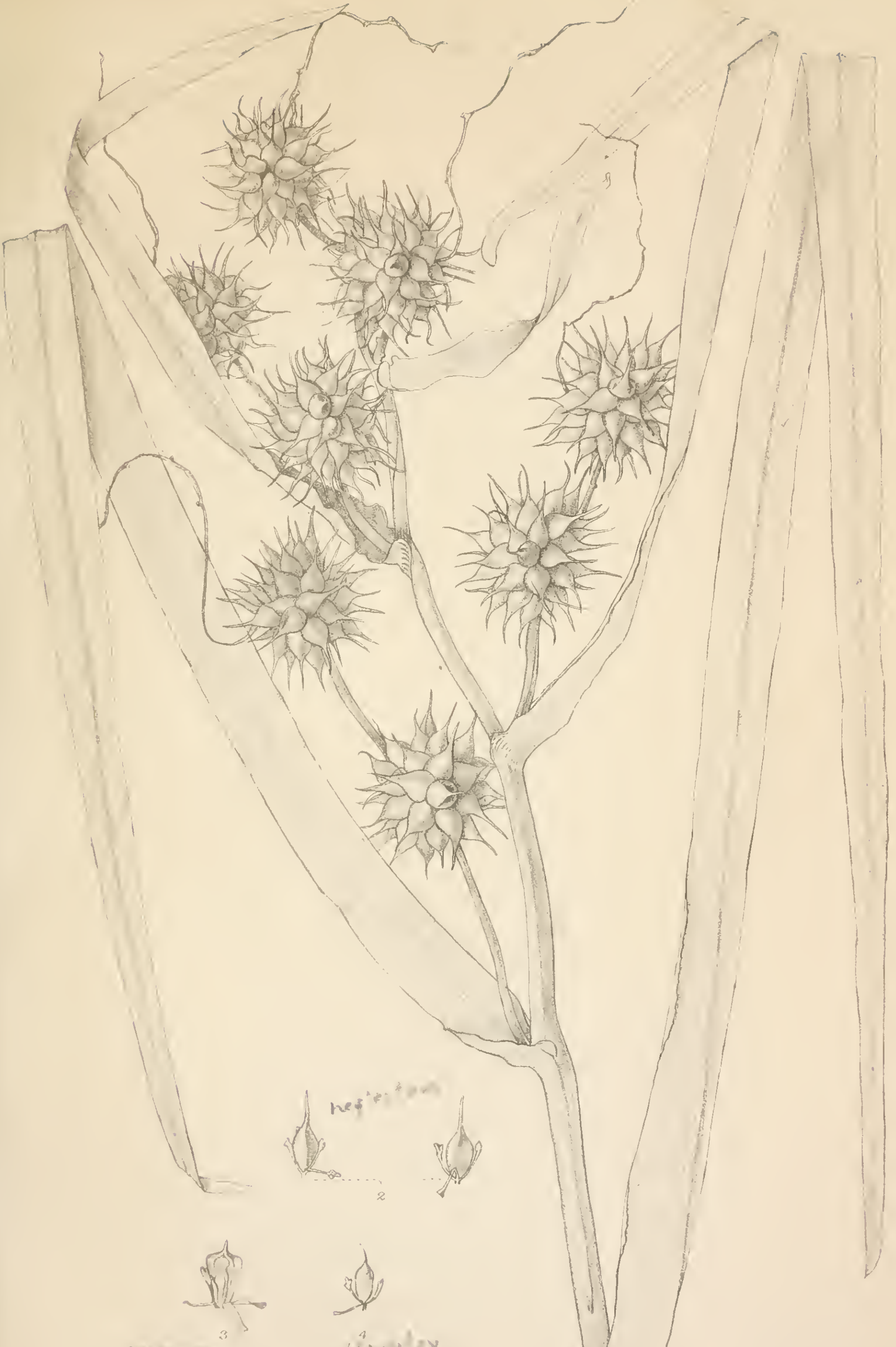
Journ. Linn. Soc. (xxi., No. 137). — (April 29). J. G. Baker, 'Further Contributions to the Flora of Madagascar' (*Holocarpa* (Anthospermeæ Rubiaceæ); *Apodocephala* (Compositæ Eupatoriaceæ) (new genera; many new species).— H. N. Ridley, 'The Orchids of Madagascar' (many new species; 1 plate (*Bicornella*).)

Œsterr. Bot. Zeitschrift. — A. Kornhuber, 'Zweibelbildung bei *Leucojum.*' — R. v. Wettstein, 'Pilzflora der Bergwerke' (*Merulius cartilagineus*, *Polyporus lucens*, *P. silaceus*, *Agaricus disciformis*, spp. nn.). — E. Formanek, 'Flora des böhmisch-mährischen Sehneegebirges.'—A. Hausgirg, 'Mykologisch-algologische Beiträges aus Böhmen.'—E. Fick, 'Streifzüge in Russland.' — P. G. Strobl, 'Flora des Etna' (contd.).

Pharmaceutical Journal (May 16). — H. Groves, 'Hints for Beginners of Botanical Collections.'

Science-Gossip. — E. Malan, 'Fertilisation of *Orchis mascula.*'

Tab. 258.


neglectum
2
3
ramosum
4
simplex

E M Beeby del R Morgan lith

West Newman & Co. imp.

Sparganium neglectum. *Beeby.*

ON *SPARGANIUM NEGLECTUM.*

By W. H. Beeby.

(Tab. 258.)

Sparganium neglectum Beeby (Journ. Bot. 1885, p. 26).—Rootstock soboliferous. Root-leaves 3–5 feet long, triquetrous at their base, channeled on the upper side and keeled almost throughout, rigid, erect, never flaccid nor floating even in running water, exceeding the flower stem. Stem-leaves, which are somewhat channeled in their lower half, and bracts, usually keeled to their apex. Inflorescence a compound spike, each branch bearing 1–3 female heads with many male heads above them. Fruit nearly or quite sessile, obovate-pointed, sometimes narrowly so, or when two-seeded roundly obovate, generally rather more than twice as long as broad (excl. beak), not truncate, but narrowed gradually into the beak,[*] which is $\frac{1}{2}$–$\frac{3}{4}$, commonly $\frac{2}{3}$, the length of the fruit itself; slightly obtusangular by compression, with a terete transverse section, its epicarp of numerous small cells, which continue dense and compact in the ripe fruit, and thus conceal the ridges of the endocarp. Female perianth scales linear, with a broad spathulate apex. Herbage drying a more or less pale green.

The habit is much that of *S. ramosum* Curt., which, however, differs from the above conspicuously in the form of the fruit, as well as in the structure of its epicarp, which is composed of a few large loose cells; in the ripe fruit these collapse somewhat into the furrows between the ridges of the endocarp, thus allowing the latter to be prominent, and giving to the fruit its angular appearance and irregular transverse section. The female perianth scales are mostly ligulate, more membranous, and scarcely or not at all enlarged at the apex, and the fruit is more frequently two-seeded than in *S. neglectum*. The upper leaves and bracts are less harsh and more leathery in texture, the latter usually quite without a keel, and drying blackish or olive-green.

No allusion to the fruit is made by Hudson (Fl. Ang. ii. p. 401) in his description of *S. ramosum*, and his plant may perhaps best be regarded as an aggregate, including that now described and the *S. ramosum* Curtis (Fl. Lond. f. 5, pl. 342, and description), which latter is also the *ramosum* of Syme (E. B. iii.), and apparently of most authors. I do not now feel sure which plant is represented by Reichenbach's plate (see p. 26, *ante*). The description by Leighton (Fl. Shropshire), "fruit ovate-acuminate, angular by compression," and that of Garcke (Fl. Nord und Mittel Deutschland), "fruit long-beaked," point to the present plant as the one actually seen by those authors; and these are the only references I have met with which seem applicable to *neglectum*.

I do not find that *S. neglectum* has any characters in common with *S. simplex* beyond the pointed apex to the fruit and its long beak.

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[*] The term beak is restricted to the persistent style, exclusive of the stigma, which is also sometimes persistent.

Besides from Surrey, where there are many stations, of which I may mention New Pond, Merstham, and the boggy meadow west of Reigate Heath, I have seen specimens from E. Sussex (H. T. Mennell); and there is a plant from Mrs. Robinson's Herbarium at the British Museum, without locality, named *S. ramosum* by Rev. G. E. Smith. I have seen immature specimens, probably referable to this, from S. Essex, E. Suffolk, Hunts or Cambs., Worcester, and Salop. A plant in Hb. Brit. Mus., collected by Dr. Trimen at Lowestoft in 1859, and placed by him on a sheet of *S. simplex*, with the remark, "vide length of anthers and beak of fruit," is doubtless the early state, with which I am yet scarcely acquainted.

The only continental specimens seen, which are certainly referable to *S. neglectum*, are the following:—Marais de Gourze, Vaud, Switzerland, leg. Blanchet (in Herb. Kew); Antibes, Alpes Maritimes, France (Herb. Thuret in Paris Herbarium), and Senart (France?), 1822 (Herb. Brongniart, with the last). Ripe fruit of the two last was kindly sent me from Paris last month by Mr. George Nicholson; it is quite undistinguishable from that of the Surrey plant, and Mr. Nicholson tells me that the habit is the same.

A plant from Pancorvo, Spain (Hb. Shuttleworth, Brit. Mus.) may belong here; the fruit, however, is not ripe, and, while not *ramosum*, the possibility of the occurrence of other forms makes it unadvisable to speak more definitely. All the above are under the name *S. ramosum* Huds., with the exception of Dr. Trimen's Lowestoft plant.

Prof. Asa Gray writes that specimens sent him were referred to Mr. S. Watson, who reports (December, 1884) that they "do not accord with any American form we have." The known distribution is therefore confined to the Old World, and to Europe.

I desire to express my indebtedness to the various authorities, both British and continental, who have so kindly examined specimens and reported upon them. With one exception here, all the opinions received are in favour of regarding *Sparganium neglectum* as a distinct species.

Description of Plate.—1. *Sparganium neglectum*, from a Reigate specimen (about three-fourths natural size). 2. Ripe fruit of the same. 3. Ditto, of *S. ramosum*. 4. Ditto, of *S. simplex* (2, 3, and 4 natural size).

RECENT ADDITIONS TO THE BRITISH LICHEN-FLORA.

By the Rev. J. M. Crombie, F.L.S.

Since my last list in this Journal for 1882 (p. 271), the following species and varieties have now to be recorded. Though not so numerous as usual, several of them are in various respects very interesting. The new species have, as usual, been recorded by me from time to time in 'Grevillea.'

Gonionema compactum (Ag). On rocks, Mardale, Westmoreland (Martindale). Fertile.

Ephebeia hispidula (Ach.). On micaceo-schistose rocks above Loch-na-Gat, Ben Lawers (Crombie). Fertile. — **E. Martindalei* Cromb., Nyl. in Flora, 1883, p. 104, subsp. n. On rocks, Mardale, Westmoreland (Martindale). Fertile.

Synalissa intricata (Arn.) Nyl. in Flora, 1883, p. 534. On moist granitic rocks, north side of Black Craig, New Galloway, alt. 400 ft. (J. McAndrew). Spermonogiiferous.

Leptogium (*Homodium*) *humosum* Nyl. On mortar of walls, Port Gorey, Island of Sark (Crombie).

Collema isidioides Nyl. in Flora, 1883, p. 98, sp. n. On calcareous rocks, Warton Crag, Westmoreland (Martindale). Sterile.

Stereocaulon Delisei Bor. Amongst mosses on granitic boulders, near Lough Eagh, Moor of Rannoch (Crombie). Sterile.

Thamnolia vermicularis, var. *taurica* (Ach.), On the ground, near the summit of Cairngorm, Braemar (Crombie). Very sparingly.

Peltigera scabrosa Th. M. Fr. On turf-covered stone walls, near Corriemulzie, Braemar (Crombie). Probably to be detected elsewhere.

Physcia melops (Duf.) Nyl. On limestone walls, Appin, Argyleshire (Crombie). Sterile and very sparingly.

Lecanora (*Placodium*) *elegans*, var. *tenuis* (Mhlnb.). On subalpine rocks, Whimbold Rocks, New Radnor, Wales (Joshua). Craig Guie, Braemar (Crombie). Sterile. — *L.* (*P.*) *miniatula* Nyl. in Flora, 1883, p. 98. On quartzose rocks, Morrone, Braemar, alt. 1850 ft. (Crombie). — *L.* (*P.*) *obliterascens* Nyl. in Flora, 1883, p. 99. On rocks, Craig Tulloch, Blair Athole (Crombie). This and the preceding may both be only varieties of *L. tegularis* (Ehrh.). — *L.* (*P.*) *tegularis*, f. *Arnoldi* (Wedd.). On rocks, Dunkerron, Kerry (Dr. T. Taylor). — *L.* (*P.*) *scopularis* Nyl. in Flora, 1883, p. 105. On maritime rocks, Portlethen, Kincardineshire (Crombie). — *L. irrubata* * *Siebenhaariana* (Krb.). On schistose rocks, summits of Ben Lawers and Craig Calliach (Carroll and Crombie). — *L. circinatula* Nyl. in Flora, 1883, p. 100. On flints in maritime districts. Beachy Head, Sussex (Crombie). — *L. galactina*, var. *deminuta* (Stenh.). On calcareous rocks, Craig Guie, Braemar (Crombie).— *L. urbana* Nyl. On mortar of walls near Shiere, Surrey (Crombie). — *L. prosechoidiza* Nyl. On maritime rocks, Portlethen, Kincardineshire (Crombie). — *L. conizæoides* Nyl. *in litt.*, sp. n. Subsimilar to *L. conizæa* Ach., but with the thallus less yellow (whitish yellow) and the spores more turgid (0·009–11 mm. long, 0·005–7 mm. thick). On trunks of old beech-trees, near the roots, Epping Forest and New Forest (Crombie); Buxton, Derbyshire (Holl.). — *L. subdepressa* Nyl. On maritime and mountainous rocks. Probably not uncommon in W. and N. England, the Scottish Grampians, and W. Ireland. Usually not rightly separated from *L. gibbosa*. — *L. decincta* Nyl. in Flora, 1882, p. 452. On schistose rocks, Red Scues, Westmoreland (Martindale). — *L. subradiosa* Nyl. On walls, East Allendale, Northumberland (Rev. W. Johnson).

Pertusaria carneopallida Nyl. On the smooth bark of trees, North Wales (Griffith); Glen Lochay, Perthshire (Crombie).

Urceolaria actinostoma (Pers.). On rocks, Chateau Point, Island of Sark (Crombie). —Var. *cæsioplumbea* Nyl. Along with the type, but sparingly.

Lecidea aggregatula Nyl. in Flora, 1883, p. 101. On porphyritic rocks, Charnwood Forest, Leicestershire (Larbalestier, L. Hb. n. 338, sub *Lecanora*). — *L. percontigua* Nyl. in. Flora, 1882, p. 457. On rocks, Whitehaven, Cumberland (Johnson). — *L. periplaca* Nyl. in Flora, 1882, p. 454. On walls, Staveley, Kendal, Westmoreland (Martindale). — *L. tenebrica* Nyl. *l. c.* On schistose rocks, Red Scues, Westmoreland (Martindale). — *L. coriacella* Nyl. *l. c.* On porphyritic rocks, Red Scues, Westmoreland (Martindale). — *L. plumbina* Anzi. Parasitic on the thallus of *Coccocarpia plumbea.* Borrowdale, Keswick, Cumberland (Johnson).

Verrucaria globosa Tayl. in MSS.; Nyl. in Flora, 1883, p. 534. On trachytic rocks, Blackwater, Kerry (Dr. T. Taylor). — *V. canella* Nyl. in Flora, 1883, p. 102. On calcareous rocks, Bangor, N. Wales (Griffith).

SOME MORE NOTES ON DOVEDALE PLANTS.

By the Rev. W. H. Purchas.

(Concluded from p. 184).

Pyrus rupicola. Mr. Baker did not see this on the Derbyshire side of Dovedale; had time allowed him to penetrate farther up the Dale he would have fallen in with numerous small trees of it. Many of them grow in inaccessible situations, but all which I have been able to examine belong to *P. rupicola.* — True *P. Aria* exists, as Mr. Painter stated on my authority, as a single tree at the edge of a plantation near the fifth milestone on the road from Ashbourne to Buxton, but it has the appearance of having been planted; the tree is an old one, and flowers freely, but there are no traces of young seedlings.

Epilobium roseum occurs sparingly at Fenny Bentley. The late Rev. G. E. Smith told me also that it grew near Osmaston, by Ashbourne, but it is a scarce plant in the district. — *E. obscurum* occurs also at Fenny Bentley, in company with *E. montanum.* Some few specimens growing with *E. montanum* and *E. obscurum* at Fenny Bentley have much the appearance of being hybrid between these two, although chiefly akin to *E. montanum.* I have also found on the banks of the Dove a form having characters intermediate between *E. parviflorum* and *E. obscurum.* Specimens of this were lately sent to the Botanical Exchange Club with other intermediates between these two species from this part of Staffordshire. — *E. palustre*, which is common in the Staffordshire moorlands, seems wholly to avoid the limestone.

Myriophyllum spicatum. In the Reservoirs at Cromford, where my attention was called to it last year by Mr. C. Bailey.

Callitriche verna. In the River Bradford, at Youlgrave. See B. E. C. Report for 1876, p. 18. — *C. platycarpa* is the commoner plant in this neighbourhood.

Ribes alpinum. Plentiful in several parts of Dovedale; strictly diœcious. The frequency with which this occurs in the old cottage gardens, together with the fact that some of the Dovedale localities where it occurs most plentifully are near some of these old cottage gardens, made me for some time to question its claims to be considered native here; but farther search has shown me colonies of strong old bushes of both sexes in nooks and clefts where there is little suspicion of human agency. In Staffordshire it occurs in the neighbouring valley of the Manifold (limestone), near Wetton Mill. I haue always been puzzled to account for the frequency of this plant in old cottage gardens. Its fruit is worthless, and even the staminate plant, which is much more showy than the pistillate, is hardly so much so as to make it valued as an ornamental shrub, In Herefordshire, where the plant is sometimes seen in hedges, I only observed the pistillate form.

Saxifraga granulata is quite a feature in the pastures in the early summer.

Chrysosplenium alternifolium. Banks of the Dove, in one or two spots, but rather scarce; also on the banks of a brook between Ashbourne and Fenny Bentley.

Parnassia. Dovedale and some of the tributary valleys, but not in the abundance in which it occurs near Buxton.

Sedum acre so abounds on some of the stony hillsides of Dovedale that in early summer they are perfectly yellow with it.

Sanicula europæa. Scarce in the district, but it occurs in Biggin Dale, a tributary of the valley of the Dove.

Pimpinella magna is more common than *P. Saxifraga* in these parts.

Torilis infesta is recorded from Dovedale in Sir O. Moseley's Nat. Hist. of Tutbury. I have not myself met with it.

Conium maculatum. Banks of the brook near the Callow, Ashbourne, in plenty, 1884.

Carduus heterophyllus Linn. Dovedale and Beresford Dale.

Centaurea Scabiosa. With white flowers at Brassington Rocks.

Artemisia vulgaris is very scarce on the limestone, and is wholly absent from Dovedale and its immediate neighbourhood. It occurs on the New Red Sandstone E. of Ashbourne.

Senecio sylvaticus, which entirely avoids the limestone, occurs on the coarse millstone grit about Birchover and Stanton, notably at the curious rocks called Robin Hood's Stride. — *S. erucifolius.* The spot where Mr. Baker noticed this, near the Peveril Inn, is the only station I know of for many miles around.

Chrysanthemum Leucanthemum affects the crevices of the limestone rocks, as well as being frequent in grassy places.

The absence of *Leontodon hirtus* is remarkable. It was only after special search that I found it on one of the limestone slopes on the Staffordshire side of the Dove Valley. On the Derbyshire side I have not yet been able to meet with it.

Taraxacum officinale, var. *palustre*, occurs in a swampy part of Dovedale.

Crepis paludosa. Near the source of the Dove, and I think on the Derbyshire side of the stream, but ceasing when the limestone is reached.

Hieracium. Mr. Baker remarks on the absence of *H. murorum* and *H. cæsium.* The plant, however, which Mr. Baker regards as *H. cæsium*, var. *Smithii*, occurs on the rocks of Dovedale, ascending to nearly 1100 ft, and has been recorded by Mr. Painter. I first met with this, some twenty years ago, on the rocks of Middleton Dale. Mr. Baker, to whom I lately sent some Dovedale specimens, considers it identical with the plant of the limestone rocks of Yorkshire, and to be truly *H. cæsium*, var. *Smithii.* Dr. Boswell, on the other hand, as confidently refers it to *H. pallidum.* Between these opinions it is not for me to attempt to decide. I will only say that the Derbyshire (and Staffordshire) plant is very glaucous, and that the leaves are much more suddenly narrowed at the base than in Dr. Boswell's Fifeshire *H. pallidum;* and with radiating teeth, which, as in that, are often half an inch long. On the other hand, the Derbyshire plant differs notably from a Herefordshire plant which I have known for many years, and of which examples pronounced by Mr. Baker to be *H. cæsium* were sent to the Botanical Exchange Club by the Rev. A. Ley (see Report for 1882). The leaves of this plant from the limestone rocks of the Herefordshire Wye Valley are broader in outline than those of the Derbyshire plant, and, instead of long radiating teeth, have scarcely more than denticulations on their margin; the Derbyshire plant also wants the reddish purple so noticeable on the under surface of the leaves of the Herefordshire "*H. cæsium.*" I have met with this Derbyshire *Hieracium* at Linton, N. Devon, and on rocks near Tenby, from which latter place it was recorded by Mr. E. Lees in the 'Phytologist,' O. S., 1853, p. 1018. It is a form which departs from *H. murorum* rather in the direction of *H. anglicum* than of *H. sylvaticum.*—True *H. murorum* seems to be very rare in Derbyshire; I have, however, met with it well marked between Miller's Dale and Cressbrook, as also in Ashwood Dale, Buxton, but in small quantity only. I have cultivated this Ashwood Dale plant for several seasons side by side with the green typical *H. murorum* from the woods of Herefordshire, and I can see no farther difference than that the Ashwood Dale plant has just a slight tendency to be glaucous.—The form of *H. vulgatum*, which Dr. Boswell has distributed under the name of "*H. rosulatum*" from Fifeshire, occurs with the type on the rocks of the Dove Valley. — *H. umbellatum.* On the Yoredale Rocks of the upper part of the Dove Valley, I think on both the Derbyshire and Staffordshire sides of the stream, which is there very narrow, but ceasing when the limestone is reached.

Jasione montana, like the last, occurs freely on the Yoredale Rocks of the upper part of the course of the Dove; but I have never seen it on the limestone, and I think there must be some mistake as to its having been met with in Dovedale. On the millstone grit at Robin Hood's Stride, near Birchover.

Vaccinium Myrtillus usually avoids the limestone, especially when close at the surface, but it appears with some other relics of the old moorland vegetation on a part of Allsop Moor, near Newhaven. It may be that the curious sandy deposit which is found in various spots on that elevated tract may be there also, and may have helped to supply a congenial peaty soil for heathland plants. I hope to pay more attention to this point than I have done.

Ligustrum vulgare. Rocky limestone slopes of the Dove Valley, from 600 to 1000 ft.

Gentiana Amarella. On limestone in Dovedale; and also on grit elsewhere. — I have not seen *G. campestris* on this western side of Derbyshire.

Polemonium cæruleum. Rocky banks in several parts of the Dove Valley, although not in Dovedale proper.

Verbascum nigrum, which a few years ago was plentiful at Alport, near Youlgrave, has quite disappeared for the last two seasons.

Scrophularia Balbisii is singularly absent from the valley of the Dove and its immediate surroundings. I have noticed it in the Via Gellia, as did Mr. Baker, but all search for it nearer home has been in vain. A pale-flowered variety of *S. nodosa* in the Via Gellia with the usual form.

Linaria vulgaris is, so far as my observation goes, confined to the Staffordshire side of the Dove Valley, and to one spot only a mile or two above Dovedale proper.

Menthæ are not plentiful. *M. sylvestris* is to be seen in Dovedale, but only in one spot, and in very small quantity.

Calamintha Clinopodium. Valley of the Dove, between Thorpe and Mappleton.

Stachys ambigua. Between Derby and Mackworth; a form which comes rather nearer to *S. sylvatica* than does Mr. H. C. Watson's Surrey plant or Dr. Boswell's Orkney plant in that the leaves are more ovate, their serratures more convex-sided, and the flowers smaller and darker. — *S. Betonica.* Meadows between Thorpe and Mappleton.

Galeopsis versicolor. In plenty in a field near Youlgrave a few seasons ago.

Myosotis palustris, which so abounds in various parts of the valley of the Derbyshire Wye, is entirely absent from that of the Dove. — *M. sylvatica.* Dovedale and Fenny Bentley; much more common, in fact, in this neighbourhood than *M. arvensis*, and flowering several weeks earlier than it. — *M. repens.* I feel pretty sure that I gathered this in a wet place near Blackwall, Hulland, some years since, but I cannot find a record.

The *Symphytum*, so very abundant a few seasons ago by the side of the stream between Grange Mill and the Lilies Inn, at the head of the Via Gellia, has now greatly diminished in quantity. Specimens of this plant have been sent to the Botanical Exchange Club by both Mr. C. Bailey and myself. In the Botanical Exchange Club Reports for 1877–8, p. 17, this plant is regarded by Dr. Boswell as probably *S. peregrinum* Ledeb. In the other station near Youlgrave (misprinted Yurlgrave) I saw but one patch of it.

Lysimachia nemorum. Scarce in N. Derbyshire, and only seen by me sparingly in the upper part of the Dove Valley.

Polygonum Bistorta. Fenny Bentley.

Daphne Mezereum exists, although in very small quantity, on the Derbyshire side of the Dove Valley.

Populus tremula would have been seen by Mr. Baker had time allowed him to explore the upper part of Dovedale. It grows about the rocks in which are the caverns called the Doveholes, but in small quantity.

Salices are fewer in N. Derbyshire than even in N. Staffordshire. — *S. viminalis*, *alba*, *cinerea*, and *Caprea* occur in the upper reaches of Dovedale. Near Lode Mill, and again farther down the stream are some small trees of *S. Forbyana* (identified with very little doubt by the Rev. J. E. Leefe). The head-quarters, however, of this species are on the Staffordshire bank of the Dove, just below Lode Mill, where there are several old trees about 15 ft. high, and I suspect that the younger bushes have been derived from these through branches which have been torn off by winds or floods having been carried down and lodged on the banks, there taking root and growing. In other cases I think they must have been planted as cuttings: all are the female plant. I find this to be one of the willows most frequently planted near houses and gardens hereabout, I suppose for the sake of a supply of twigs. — *S. lanceolata* Sm. A willow found in Miller's Dale is thus named by the Rev. J. E. Leefe. So far as can be decided without comparison of the catkins (for Mr. M. Kay's specimen is without them), this is exactly the same as the plant from Cambuslang, Lanarkshire, distributed by the Botanical Exchange Club under the name of *undulata*. The Derbyshire plant was met with late in August, where it was flowering a second time, just as the *Triandræ*, and more frequently *S. hippophaæfolia*, will do. It is the pistillate plant (Has the staminate plant been yet found in Britain?), and has the appearance of being native on the river-bank.

Taxus baccata. Plentiful on some of the cliffs of Dovedale.

Of Potamogetons, *P. crispus* is the only species I have been able to find in the Dove. — *P. natans.* In a pond near the Ashbourne and Buxton Road, four miles from Ashbourne. — *P. zosteræfolius.* In the Cromford Canal, and in Reservoirs at Cromford, where my attention was called to it last summer by Mr. C. Bailey.

Orchids are less plentiful than might have been expected.— *Orchis pyramidalis.* On the slopes of the Via Gellia. I have not met with it in Dovedale. — *O. mascula* and *maculata* are common.

Gymnadenia conopsea. In the Via Gellia, sometimes with white flowers. Although occurring plentifully in one of the Staffordshire valleys a few miles west of Dovedale, I have not seen it between that Staffordshire habitat and the Via Gellia, a distance of eight or nine miles.

Habenaria viridis. Pastures near Hipley Tollbar, on the road between Parwick and Brassington. — *H. chlorantha.* Dovedale, and between Thorpe and Mappleton, but capricious in appearing.— *H. bifolia* I have not seen on the Derbyshire side, although it occurs in some plenty on one part of the half-reclaimed Staffordshire moorland in this parish. I have never yet met with *H. bifolia* in the rich vegetable soil of woods, which *H. chlorantha* seems to affect; *H. bifolia* seems to prefer somewhat heathy ground.

Ophrys muscifera occurs very sparingly in Dovedale, but I have sought in vain for *O. apifera*.

Listera ovata. Dovedale, but scarce.

Epipactis latifolia. Brassington Rocks and Dovedale. The form which occurs in Dovedale is one which shows a strong preference for limestone, and is identical, or very nearly so, with the Herefordshire plant from Little Doward Hill, referred by Prof. Babington to *E. ovalis*. This form agrees with the *E. ovalis* of Settle and the Ormshead in general growth, in the somewhat sudden passage from leaves to bracts, in the bracts being mostly shorter than the flowers, and in the transversely oval outline of the label; but it differs in the surface of the label being smooth, the basal "hunches" not being prolonged downward so as to occupy the centre of the label with an elevated rugose protuberance, but confined to the constriction which separates the two portions of the lip. On account of this difference I have always ventured to doubt the identity of the Herefordshire "*ovalis*" with the plant of Yorkshire and the Ormshead; and now, after having again very carefully compared them, I can only say that I still think them different; the differences are indeed but small, but much more tangible than any which separate the Herefordshire "*ovalis*" (and the Dovedale plant also) from the forms by which it gradually passes into the larger and more general plant which Prof. Babington pointed out to me as his *E. media*, but which better answers to his description of *E. latifolia*. The character of the label of the true *ovalis* is shown in the enlarged figure on the Eng. Bot. plate, and is confirmed by a careful pencil-sketch made from a fresh Settle specimen by the late Rev. G. E. Smith, and sent to me not very long before his death. A comparison of these with my own sketches made from the living Herefordshire plant makes the difference clear, and supports my belief that the Herefordshire and Derbyshire plants belong rather to *E. latifolia* or *media* than to *E. ovalis*, but that they constitute a limestone form which, out of many, comes nearest to *ovalis*. I have from time to time during many years carefully examined the forms of aggregate *E. latifolia* which I have met with either in the south-western or in the midland counties, but I have never been able to see that the forms existing in Nature were adequately recognised in books; and I still venture to think that a more extended study of these plants would lead to the adoption of some more varietal forms than at present, and very probably also to some rearrangement. There are drawbacks to the study of the forms of *Epipactis* in the facts that they are rarely found in any quantity so as to allow of the comparison of many individuals whilst fresh, and that, unless very unusual care be taken in the pressing, there is little to be made out about the flowers from dried specimens. It is best to detach one or two flowers, and spread out the label between slips of paper, so as to exhibit its form. Mr. Baker tells me that he has met with a limestone *Epipactis* in the Lake district, which he at first thought might be *ovalis*, but which he afterwards decided to be *latifolia*. It seems likely to be identical with the Herefordshire plant.

Paris quadrifolia. Dovedale, but scarce.

Polygonatum officinale. Dovedale.

Allium ursinum. Abundant in one part of Dovedale. — *A. oleraceum*. I had the pleasure of meeting with this, last August, in the clefts of one of the Dovedale rocks, about 1100 ft. I think not previously recorded from the county.

Scirpus setaceus. Dovedale. — *S. sylvaticus*. By the Dove, above Hartington.

Carex muricata. Between Hartington and Beresford Dale.— *C. vulpina*. Between Sandy Brook and Rose Cottage, near Ashbourne. — *C. riparia*. Near Bradbourne Mill. — *C. paludosa*. Banks of the Bradford, at Youlgrave.

Avena pubescens is abundant in limestone pastures.—*A. pratensis*. Very much less common.

The *Glyceria* which is so abundant in the lower reaches of Dovedale is *G. pedicellata*. — There are two forms of *G. plicata*; one, which I suppose to be the typical plant of Fries, is glaucous, with blunt broad leaves, which are folded in vernation; the other, a much taller plant, quite green, like *G. fluitans*, and with narrow-pointed simply-folded leaves, and with a much larger panicle; both of these, as well as *G. pedicellata*, were observed by Mr. C. Bailey and myself about the upper Reservoirs of the Via Gellia. These forms seem to have received little notice from botanists, but their differences are obvious if a little attention is given to them. Of *G. pedicellata* the fruit seems invariably abortive, if not infested with ergot, to which it is peculiarly liable. I observe that Mr. Townsend in his original description gave no account of the caryopsis, probably never having seen it.

Festuca. There is in Dovedale and various other places a very glaucous form, which I presume to be that intended under the name of *F. ovina*, var. *glauca*, of the 'Student's Flora.'—*F. elatior*. Dovedale and elsewhere; especially plentiful in the Via Gellia; when in flower its divaricate panicle-branches make it conspicuous.

The absence of *Bromus erectus* has always struck me as remarkable; I see, however, that Mr. Painter records it from Miller's Dale.

The Ferns of the district have grievously suffered from the ravages of the guides. — *Ceterach officinarum*, which, I am credibly informed, was formerly abundant on the rocks of Dovedale, is almost absolutely extinct. I have this day, after a careful search, succeeded in finding a single small plant (which I of course left undisturbed) in a place which had been mentioned to me, but I know not where I could find another on the Derbyshire side.

Polypodium Robertianum is no longer to be found on the Derbyshire side of Dovedale. The extremely dry summers of 1868–1870 seem to have destroyed it; the spot on which I am told that it grew plentifully is much exposed. I have seen it, but in very small quantity, on the Staffordshire side.

Aspidium aculeatum has been nearly eradicated. — *A. angulare* I have never yet met with in Derbyshire, though I have seen it on the New Red Sandstone in Staffordshire.

Botrychium Lunaria. I once met with this on one of the hills above Dovedale, at about 1200 ft. elevation.

Pteris is absent from Dovedale, and I do not know a nearer station than Hartington Dale, some five miles off, where it is growing on limestone. It is very scarce on the North Staffordshire moors.

I hope hereafter to follow up these Notes on North Derbyshire Botany by a list of the species which I noted down during the years I passed in the extreme south of the county.

NOTES ON THE FLORA OF CEYLON.

By Henry Trimen, M.B., F.L.S.

(Continued from p. 176).

Descriptions of New Species and Varieties.

Alsodeia decora Trim. — Glabrous, the young twigs finely pilose; leaves oblong-lanceolate, somewhat trapezoid, shortly acuminate, the apex very obtuse or emarginate, the upper half shallowly crenate-serrate; petiole short, slender; stipules subulate, early caducous; flowers not seen; fruit solitary, on slender peduncles from short scaly branchlets in axils of fallen leaves; persistent sepals rigid, lanceolate, acute; persistent petals strap-shaped, twice as long as sepals; capsule over $\frac{1}{4}$ in. long, glabrous; seeds 3, mottled.

Hab. Near Great Western Hill, Hewahette, Cent. Province, 1868. (C. P. 4006 in Herb. Perad.)

Leaves 2–2$\frac{1}{2}$ in. long, rather stiff, veins reticulated, strongly marked on both surfaces. Petals $\frac{1}{8}$ in. Fruit-stalks $\frac{1}{6}$ in. long. Dr. Thwaites has called this *A. obtusata* (in Hb. Perad.), a name too closely similar to *A. obtusa* Hassk. to be adopted.

Vatica obscura Trim. — Leaves narrowly oblong-lanceolate, acuminate, obtuse; lateral veins about 12 on either side; venation prominent beneath; flowers stalked, in short lax leafy panicles in the leaf-axils; branches of inflorescence densely scurfy or stellately pubescent. Calyx small, $\frac{1}{10}$ in.; segments oval-lanceolate, subacute; petals $\frac{1}{2}$–$\frac{3}{4}$ in. long, oblong strap-shaped, the base concave and stiff; fruiting calyx (not fully matured) much enlarged, fully $\frac{1}{4}$ in.; the segments equal, broadly oval, obtuse, 3-veined; ripe fruit not seen.

Hab. Forests in the Eastern Province. Leaves 4–6 in. long by $\frac{1}{2}$–1 in. broad, paler beneath, pellucid-punctate with transmitted light; petiole $\frac{1}{2}$–$\frac{3}{4}$ in. long, slightly pubescent when young. Flowers rather large; petals white, with a pink base; stamens 15: anthers broadly oblong, connective apiculate; ovary conical puberulous; style a little longer than calyx, with a capitate stigma.

A poor specimen in immature fruit was sent me in 1882 by Mr. Vincent, with the vernacular name of "Tampalé," and is referred to in his Report on the Ceylon Forests (par. 106, 147) as "*Vatica* sp.," and described as a fine timber-tree. I have since received good flowering specimens collected in June, 1884, by Capt. Walker, Forester, at Polukanawa in the same district; and this gentleman is endeavouring to obtain also ripe fruit, which it is very desirable to examine. *V. obscura* is apparently a near ally of *V. affinis* Thw., a tree of the S.W. of Ceylon, but ripe fruit may show them to be more distinct than now appears. The principal differences consist in the narrower and thinner leaves with twice as many lateral veins, the less deeply divided calyx with more obtuse segments, and the larger flowers of *V. obscura.* I was at first inclined to refer the latter, from descriptions only, to *V. lanceæfolia* Bl. (*Vatica* Roxb.), of East Bengal, but Mr. Thiselton Dyer, to whom I submitted a specimen, thinks it certainly not that plant.

All these belong to Wight's *Isauxis*, a good genus, but not requiring a new name, being the original *Vatica* of Linnæus. *V. chinensis* L., the type of the genus (figured in J. E. Smith's Ic. Ined. t. 36), is clearly the same as *V. Roxburghiana* Bl.,* the common "Mendora" of Ceylon; but I suppose this specific name may have to be regarded as a "nomen falsum," as the plant does not grow in China. In this genus the calyx-segments are all equally enlarged in fruit. Included also in *Vatica* by the authors of the 'Genera Plantarum' are other species to form a section, unfortunately termed *Eu-vatica*, in which two only of the calyx-segments are greatly enlarged; on the principles followed for genera in this family, this should rather be considered as distinct; and as it seems to be *Sunaptea*† of Griffith that name may be adopted. To it belongs *Vateria* (*Stemonoporus*) *scabriuscula* Thw. Enum. p. 404 (*Vatica* A. DC.), the fruit of which has been discovered more recently, and probably also *V. disticha* Thw. *l. c.*, of which the fruit is still unknown. The fruiting-calyx of this genus is much like that of *Hopea* (in which, as "Sect. 2," A. DC. includes *Sunaptea grandiflora*); but the segments are free and loose, not twisted and imbricated, as in *Hopea* (*i. e.*, *H. discolor* and *H. jucunda* of Ceylon).

Thorea Dyerii Thw. ms.—Leaves (floral) $2\frac{1}{2}$–3 in. long, on petioles $\frac{3}{8}$–$\frac{1}{2}$ in., narrowly ovate-lanceolate, gradually tapering to the subacuminate obtuse apex; lateral veins 12–14 on either side, connected by fine transverse parallel veinlets; flowers numerous, sessile, small, rather closely placed, and secund along the upper side of the short divaricate branchlets of the large spreading axillary and terminal inflorescence; buds small, bluntly conical, the whole densely covered with a fine grey pubescence of sessilely stellate hairs, mixed on the flowers with simple silky ones; calyx-segments broadly oval, subacute; petals oblong-oval, slightly concave, not twisted; stamens very small, about 60; filaments dilated at base, and prolonged beyond the adnate anther-cells into a strongly-ciliated apiculus about half as long as the anther; ovary oblong-pyramidal, pubescent; style very short; fruit not known.

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* In the 'Gen. Plantarum,' i., p. 192, "*Vatica indica* L." (*V. chinensis* being no doubt meant) is erroneously referred to *Hopea grandiflora* Wall. = *Vatica*, Dyer in Fl. Brit. India, i., p. 301.

† Griffith, Icones, iv., p. x., t. 585 A, f. 5 (flowers only). I have not the text (Notulæ, v., p. 316) here to refer to.

Hab. "South of the Island" (C. P. 4010 in Hb. Perad.). Leaves smooth on both sides or with a few stellate hairs beneath; veins not prominent. Corolla apparently red.

I regret that the material for this species is so scanty, consisting only of inflorescence in mature bud just about to expand; we have no fruit, and no large foliage. There can, however, be little doubt that it is allied to *S. oblongifolia* Thw., from which it differs in the shape of the leaves, in the petals, and in the number and form of the stamens.

I have not met with this species myself, nor do I know precisely where the specimens in the Herbarium were collected; but I am glad to be the medium of publishing Dr. Thwaites' dedication of it to my friend Mr. Thiselton Dyer, the monographer of the Indian *Dipterocarpeæ*.

Shorea brevipetiolaris Thw. ms. — Leaves ovate, 4 or 5 in. long, cordate or subcordate at base, more or less caudate-acuminate and obtuse at apex, subcoriaceous; lateral veins about 7 on either side, curved, prominent beneath; petioles thick, curved, about ¼ in. long; when young, usually very densely covered with short coarse shaggy hair, which is also scattered over the young twigs; panicles about as long as leaves, several (2–5) coming off from one axil; rachis with few short spreading branches, minutely pubescent; bracts 0 or very quickly caducous; buds subglobose, blunt; sepals ovate, obtuse, glabrous; petals not expanded in the specimens; stamens 15; filaments much dilated below; apiculus as long as anther; ovary globose, cells with 2 ovules in each; style subulate, as long as ovary; fruit not known.

Hab. Summit of Doluwe Kande, a few miles north of Kurunegala, N. W. Province, Dec., 1883. (Also C. P. 4008 (no locality) in Hb. Perad. (leaves only).).

A small tree; leaves quite glabrous, the petioles also becoming so when old, and then thickened, rugose, and chocolate-brown in colour. My specimens are in bud only; the flowers seem to be white or pinkish.

There is a young tree of this species in the Botanic Gardens, but it has not yet flowered; the leaf-specimens (C. P. 4008) in the Herbarium without locality may be from this tree. In the absence of fruit some doubt may be felt as to the genus; if a *Shorea*, as is most probable, it is not very closely allied to the other Ceylon species.

Shorea stipularis Thw., var. *minor* Thw. ms. — Leaves smaller than the type, about 3 in. long, the apex strongly twisted, very finely but densely pubescent beneath; stipules less persistent, more acute and narrower, densely pubescent, as also the young growths.

Hab. Morowe Korle, Southern Province, July, 1868, with fruit. (C. P. 3987 (in part*), and C. P. 4024, in Hb. Perad.). In the type the leaves often reach 9–12 in. in length on petioles of 3–4 in., which are much thickened and fleshy. The flowers of this curious species are still unknown, but there are young trees in the Gardens which will, it may be hoped, in time supply them. I collected in the Morowe Korle another variety with the leaves almost rotund in outline, with a very marked short acumination.

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* C. P. 3987 is in part *Doona macrophylla* Thw.

This species is frequently the subject of a curious malformation. Hard rounded pale green bodies are produced in the leaf-axils, consisting of half-fused masses of very short crowded coral-like abortive branchlets, the lobulated ends of which form the surface of the mass, which is covered with a viscous exudation. These are probably abortive and metamorphosed inflorescences.

Doona oblonga Thw. ms.—Leaves 3½–4½ in. long by 1¼–1½ in. broad, narrowly oval-oblong, rounded at base, gradually caudate-acuminate; margin recurved; lateral veins 8–11 on each side, parallel, curved, distinct; flowers not seen; fruiting calyx-segments not more than 1¼ in. long, oval-oblong, faintly veined.

C. P. 3986 in Herb. Perad. (no locality).

This is very near *D. congestiflora* Thw., but differs in the leaves and in the short broad calyx-segments of the fruit.

Vateria nervosa Thw. ms. — Leaves lanceolate-oblong, 3½–5 in. long, caudate-acuminate at apex, wedge-shaped at base, pale beneath, with few, faint, arched, lateral veins connected by reticulation; the base somewhat 3-nerved; flowers and fruit unknown.

Hab. Hewessee, Pasdun Korle, Sept., 1865. (C. P. 3815 in Herb. Perad.).

The material is scarcely sufficient, but Dr. Thwaites seems to have been satisfied that he had here a new species. It apparently comes nearest to *V.* (*Stemonoporus*) *nitida* Thw., var. *lancifolia* Dyer. Thwaites' genus *Stemonoporus* is a very distinct group confined to Ceylon, and perhaps on a general revision of the order may make good its claim to re-separation from *Vateria*.

Triumfetta conspicua Trim. — Semi-shrubby; stems 3–5 ft. high, cylindrical, much branched, wiry, rough with stellate hairs; branches elongated, erect, ascending; leaves suborbicular, rather broader than long, with a caudate base and acute apex, irregularly crenate-dentate and finely 3-lobed, quite glabrous above, pale and with a pubescence of stellate hairs beneath; inflorescence much elongated and quite leafless, with rather distant irregular paniculate clusters of stalked crowded flowers; sepals with a rather long curved spreading apiculus, densely stellate-pubescent, reddish; petals quite as long as the sepals, broad-spathulate, with long claws, spreading, ciliate at base, brilliant yellow; stamens 20; fruit globose or nearly so, ⅜ in. long or more with the spines, rather densely covered with short stiff simple yellowish hairs and with hard spreading hooked red spines, the lower parts of which are set with similar hairs.

Hab. In vast abundance on waste ground about Tissa-maharama, Southern Province, Dec., 1882; the quantity of its comparatively large flowers and their brilliant colour making it quite a showy plant. The whole covering of the plant consists of stellate hairs.

I am unable to fit this into any of the descriptions in the Indian books. I have met with it nowhere else in Ceylon than the above spot. From *T. rhomboidea* Jacq. it differs in the character of the hair, in its rotundate leaves glabrous above, quite naked inflorescence, and larger flowers nearly $\frac{3}{4}$ in. wide. The flower-buds are elongated and cylindrical, hoary, dilated at the apex, where they are covered by a star formed of the 5 spreading sepal-appendages. *T. rhomboidea* is of course an abundant weed in Ceylon, and varies somewhat in amount, but not in character, of pubescence, which is never stellate.

Eugenia (Eu-eugenia) **phillyreoides** Trim.—Shrubby, much branched; leaves numerous, crowded, small, stiff and rigid, linear-lanceolate, tapering at both ends, especially into the short petiole, subobtuse; midrib prominent; lateral veins obscure; margin revolute, glabrous (the youngest only with scanty appressed silky white hairs), dark green, paler beneath; flowers (not seen) always axillary, solitary, stalked; fruit the size of a sloe, depresso-globose, with a flat top, crowned by the short conical style, wide disk, and 4 enlarged persistent spreading rather unequal calyx-segments, 2 obtuse and 2 acute; seeds 2 or 3, plano-convex.

Hab. Summit of Kalupahane Kande, Lagalla, East Matale, May, 1884. A small dense twiggy bush with numerous erect branchlets. Leaves rarely exceeding 1 in. with the petioles. Fruit red, pubescent when young, afterwards smooth, on peduncles $\frac{1}{4}$–$\frac{3}{8}$ in. long.

This does not nearly approach any other Ceylon species; from the descriptions given, *E. Jossinia* Duth. (*Jossinia indica* Wight), of South India, must, however, be nearly allied, though quite distinct.

Eugenia (Eu-eugenia) **Haeckeliana** Trim.—Branches cylindrical, the young shoots floccose-woolly, with fulvous tomentum; leaves broadly oblong-ovate, more or less cordate at base, subacute, thick, the margin somewhat undulated; midrib thick and prominent beneath, the lateral veins (about 12 on either side) conspicuous and united by strong arches at some distance from the margin, glabrous and bright green when mature, densely covered when young with close yellow tomentum; petiole stout, very short; flowers large, solitary, on short stout peduncles coming from the axils of opposite leafy bracts on the young shoots below or alternating with the ordinary leaves; bracts a little longer than the peduncles; calyx-tube with two smaller bracts immediately below it, all fulvous-woolly; calyx-lobes 4, broad, acute, slightly recurved in flowering, afterwards erect; petals rather longer than the calyx-lobes; disk broad, square, densely woolly; fruit (not ripe) spherical, crowned by the calyx-lobes.

Hab. Among rocks by the sea-shore at Weligana, South Province, Dec., 1882. A small tree with reddish bark. Leaves 4–6 in. long, with a tendency to be stiffly bent conduplicately on the arched midrib. Flowers $1\frac{1}{4}$ in. wide; petals white, with a pink tinge.

This is readily distinguished by the flowers from *E. fulva* Thw., which much resembles it in foliage. The large bracts beneath the calyx are similar to those of the South Indian *E. floccosa* Bedd., near which the present species will stand. I have named it in remembrance of my friend Prof. Ernst Haeckel, of Jena, who spent six weeks in researches in marine zoology at the picturesque seaside fishing-village where I collected it.

Sonerila Guneratnei Trim.—Perfectly glabrous; stems numerous, erect, 12–15 in. high, slender, subquadrangular or nearly cylindrical, flexuose, smooth and shining, bare below, irregularly branched above, branches long ascending or drooping; leaves apparently whorled, 4 at each node, but in reality in two closely inserted decussate pairs, subsessile, strap-shaped, tapering below, obtuse at apex, entire below, but with 3 or 4 sharp teeth on either side in upper third, thick, with a strong midrib, deepened above, very prominent beneath; flowers few, in short terminal unilateral racemes (often reduced to solitary flowers); pedicels short, straight, deflexed in bud; calyx-tube 6-ribbed, the upper one-third or more free; teeth fleshy, deciduous; petals spreading horizontally; stamens as long as petals, all bent upward; anthers long, tapering to slightly curved elongated points; style curved like the anthers; roof of ovary formed of three erect fleshy processes together forming a conical surrounding the base of the style; capsule erect and little longer the stalk into which it tapers, cylindrical, truncate, enclosed in strongly 6-ribbed calyx-tube; seeds numerous, muriculate, orange-brown.

Hab. Near Hewessee, Pasdun Korle, first collected in August, 1868. (C. P. 4012 in Hb. Perad.).

A small straggling semi-shrubby perennial, the stems vinous-red, slightly thickened at the nodes. Leaves $\frac{1}{2}$–$\frac{3}{4}$ in. long by $\frac{1}{8}$ in. broad, the basal portion erect, then bent and spreading. Flowers coming in bloom singly in each raceme; petals $\frac{3}{8}$ in. long, bright deep pink, with a mauve tinge; anthers bright sulphur-yellow.

The very narrow leaves, *in fours*, give this a very different aspect from all its Ceylon congeners, and appear to distinguish it from all other species. *S. linearis* Hk. f., from Moulmein, has apparently even narrower leaves, and is evidently nearly allied. The specific name commemorates its discoverer, Don Leman de Silva Guneratne, Mohandiram, the native plant-collector to the Botanical Gardens, Peradeniya, which post he has held for many years, and under successive Superintendents and Directors. He was the constant companion of my predecessors Gardner and Thwaites (as of myself) in their excursions, and the former died in his arms in 1849. He possesses a wide knowledge of the Singhalese Flora, and it is perhaps not too much to say that nearly the whole of the species described by the two botanists mentioned passed through his hands as collector; Dr. Thwaites acknowledges his intelligent co-operation in the preface to the 'Enumeratio.'

Hedyotis rhinophylla Thw. ms.—Glabrous, the young shoots finely grey-puberulous; branches subcylindrical; leaves scarcely stalked, but much tapering to the base and apex, narrowly lanceolate-caudate, pale green, whitish beneath; midrib very prominent beneath; lateral veins very oblique, obscure; stipular sheath lax, $\frac{1}{6}$ in. long, the mouth fringed when young with a few stout unequal deciduous processes, when old truncate; flowers in terminal loose pyramidal paniculate cymes, on slender pedicels rather longer than the calyx; calyx-limb glabrous, campanulate, veiny, with shallow broad-triangular teeth; capsule small, not protruded beyond the enlarged calyx.

Hab. Wattekelle Hill, Kallebokka District, Central Province, Sept., 1868. (C. P. 3984 in Hb. Perad.).

Apparently a small shrub with ascending slender whitish branches. Leaves 2–3 in. long, quite glabrous. Flowers medium-size of the genus, white; corolla-lobes puberulous within. Seeds not seen.

This is a distinct species of the small group allied to the very variable *H. Lessertiana*, all of which are found only in Ceylon. *H. Lawsoniæ*, to which it also bears a superficial resemblance, differs completely in the capsule and stipule.

(To be continued.)

SUPPLEMENTARY LIST OF PHILIPPINE PLANTS.

By R. A. Rolfe, A.L.S.

In the recently published third or folio edition of Blanco's 'Flora de Filipinas' a "Novissima Appendix" is given, the object of which is to include all that is known of the Flora of the Islands up to the date of publication. In this Appendix the widely scattered references have been carefully brought together, and, so far as plants actually known from the Philippines are concerned, it is a great convenience to have them collected together in this way. In one respect, however (as I have pointed out in my paper in the 'Journal of the Linnean Society,' xxi., p. 288), the Appendix is especially disappointing. It is this—that in several orders where very little has been published respecting Philippine plants, the authors identify nearly all their plants with descriptions of species from India or the Malay Archipelago, with the result that large numbers are wrongly identified, and the endemic element is almost entirely ignored. This fact especially shows up the difficulty of satisfactorily working out a Flora without the material having been carefully compared with existing types. The fact is a most unfortunate one, and can only be remedied gradually as the materials come to hand.

The following list consists of plants which have been omitted in the above-named Appendix, and under the circumstances it may perhaps be worth while to publish it in the present form:—

Clematis Leschenaultiana DC. Syst. Veg. i. 151.—Luzon, Dist. of Benguet; *Vidal.*

Tetracera borneensis Miq. Ann. Mus. Bot. iv. 76.—Luzon, Bagag, Prov. Bataan; *Vidal.* Hitherto known only from Borneo.

Uvaria rufa Blume Fl. Jav. Anon. i. 19, t. 4 et 13. -- Luzon, Prov. Albay and Batangas; *Cuming* 1291, 1402, 1589.

U. ovalifolia Blume *l. c.* 27.--Luzon, Prov. Tayabas; Mindanao, Misamis; *Cuming* 751, 1607 in part, 1901.

Unona virgata Blume Bijdr. i. 14.--I. of Leyte; *Cuming* 1738.

Tinospora reticulata Miers Contrib. iii. 36.--Luzon, Prov. Albay; *Cuming* 1286.

Limacia cuspidata Hook. f. et Thoms. Fl. Ind. 189. -- Luzon, Prov. Albay; *Cuming* 1252.

Nasturtium montanum Wall. Cat. 4778.--Luzon; *Cuming* 479.

Capparis Lobbiana Turcz. in Bull. Soc. Imp. Mosc. xxvii. pt. 2, 323.--Luzon; *Lobb* 228, 467.

Flacourtia Cataphracta Roxb. in Willd. Sp. Pl. iv. 830.--Luzon, Antipolo, Dist. of Morong; *Vidal.*

Pittosporum brachysepalum Turcz. in Bull. Soc. Imp. Mosc. xxvii. pt. 2, 366.--Luzon, Prov. Albay; *Cuming* 1050, 1427.

Polygala chinensis L. Sp. Pl. ed. 1, 704.--Luzon; *Cuming* 699.

Xanthophyllum Griffithii Hook. f. Fl. Brit. Ind. i. 210.--Luzon, Angat, Prov. Balacan; *Vidal.*

Bergia glandulosa Turcz. in Bull. Soc. Imp. Mosc. xxvii. pt. 2, 371.--Luzon, Prov. Albay; *Cuming* 1058.

Garcinia venulosa Choisy Guttif. Ind. 34.--Luzon, Prov. Albay; *Cuming* 1124.

G. Morella Desr. in Lam. Dict. iii. 701. — Luzon, San Mateo, Prov. Manila; Tivi; *Vidal.*

Calophyllum Cumingii Planch. et Triana in Ann. Sc. Nat. ser. 4, xv., 259.--Luzon, Prov. Albay; *Cuming* 1077.

C. pseudo-tacamahaca Planch. et Triana *l. c.* 270.--Luzon, Prov. Albay; *Cuming* 1047.

C. Blancoi Planch. et Triana *l. c.* 272. -- No precise locality; *Llanos.*

C. Wallichianum Planch. et Triana *l. c.* 277. -- Luzon, Guinayangan, Prov. Tayabas; Antipolo, Dist. of Morong; *Vidal.*

C. amplexicaule Choisy ex Planch. et Triana *l. c.* 281. — Luzon, Prov. Albay; *Cuming* 1212.

Kayea philippinensis Planch. ex Planch. et Triana *l. c.* 298, *sine descriptione.*--Island of Cebu; *Cuming* 1758.

Eurya japonica Thunb. Fl. Jap. 191. — Luzon, Prov. Albay; *Cuming* 933.

E. acuminata DC., var. *euprista* Dyer in Hook. f. Fl. Brit. Ind. i. 285.--Luzon, Volcano Banahao, 6000 ft. alt.; *Vidal.*

Shorea furfuracea Miq. Fl. Ind. Bat. Suppl. 488. -- Luzon, Prov. Albay; *Cuming* 880.

Hopea philippinensis Dyer in Journ. Bot. 1878, 100. -- Luzon, Prov. Albay; *Cuming* 879.

Sida spinosa L. Sp. Pl. ed. 1, 684. -- Luzon, Prov. Albay; *Cuming* 1168.

Abutilon auritum G. Don. Gen. Syst. i. 500. -- Luzon, Prov. Albay; *Cuming* 1153.

Malachra leneariloba Turcz. in Bull. Soc. Imp. Mosc. xxxi. pt. 1, 206.--Luzon, Prov. Albay; *Cuming* 1111.

Pterospermum acerifolium Willd. Sp. Pl. iii. 729.—I. of Paragua, Batitanan; *Vidal.*

P. Sczecgleewia Turcz. in Bull. Soc. Imp. Nat. Mosc. 1863, 573. —Luzon, Prov. Albay; *Cuming* 1022.

Grewia tiliæfolia Vahl. Symb. i. 35.—Luzon, Prov. Albay; *Cuming* 1319.

Triumfettia annua L. Mant. 73.—Luzon, near Manila; *Vidal.*

Elæocarpus floribundus Blume Bijdr. i. 120.—Luzon, Antipolo, Dist. of Morong; *Vidal.*

Biophytum Apodiscias Turcz. Bull. Soc. Imp. Mosc. xxxvi. pt. 1, 599.—Luzon; *Cuming* 737.

Atalantia nitida Oliv. in Journ. Linn. Soc. v. Suppl. 25.—Luzon, Prov. Albay and Batangas; *Cuming* 991, 1598.

Garuga mollis Turcz. in Bull. Soc. Imp. Mosc. xxxiii. pt. 1, 475. —Luzon, Prov. Albay; *Cuming* 960, 1235.

Canarium ovatum Engler in DC. Monogr. iv. 110.—Luzon, Prov. Albay; *Cuming* 904.

C. minutiflorum Engler *l. c.* 123.—Luzon, Prov. Albay; *Cuming* 1006.

C. Cumingii Engler *l. c.* 132.—Luzon; *Cuming* 689.

C. gracile Engler *l. c.* 140.—Luzon, Prov. Tayabas; *Cuming* 795.

C. triandrum Engler *l. c.* 145.—Luzon, Manila-Calawan; *Callery.*

C. luxurians Engler *l. c.* 146.—Luzon, Prov. Tayabas; *Cuming* 769.

Turræa pubescens Hellen. in Nov. Act. Holm. ix. 309.—I. of Marinduque; *Vidal.*

Chailletia Benthamiana Turcz. in Bull. Soc. Imp. Mosc. 1863, 610.—Luzon, Prov. Albay; *Cuming* 1192.

Strombosia philippinensis (*Lavallea philippinensis* Baill. in Adans. ii. 361).—Luzon, Prov. Albay; *Cuming* 848.

Gomphandra laxiflora (*Platea laxiflora* Miers Contrib. i. 98).—Luzon, Prov. Albay; *Cuming* 891.

Gouania microcarpa DC. Prodr. ii. 40.—Luzon, Prov. Albay and Batangas; *Cuming* 828, 973, 1578, 1623.

Leea Cumingii C. B. Clarke in Journ. Bot. 1881, 166.—Luzon, Prov. Albay; *Cuming* 1379.

Cupania verrucosa Blume in Rumph. iii. 160.—Luzon, Prov. Albay; *Cuming* 1237.

C. revoluta (*Schleichera revoluta* Turcz. in Bull. Soc. Imp. Mosc. xxi. pt. 1, 575).—Luzon, Prov. Albay; *Cuming* 1387.

C. subundulata (*Schleichera subundulata* Turcz. *l. c.* 574).—Luzon; *Cuming* 507.

Rhus simarubæfolia A. Gray, var. *taitensis* Engler in DC. Monogr. iv. 451.—I. of Bohol; *Cuming* 1857.

Buchanania nitida Engler *l. c.* 193.—I. of Samar; *Cuming* 1703.

B. microphylla Engler *l. c.* 185.—Luzon, Prov. Albay; *Cuming* 1125.

Semecarpus philippinensis Engler *l. c.* 481.—Luzon, Prov. Albay; *Cuming* 1146.

S. albescens Kurz. in Journ. As. Soc. Beng. 1871, 51.—I. of Cebu; *Cuming* 1776.

Dracontomelum Cumingianum Baill. Bull. Soc. Linn. de Paris, 122.—I. of Samar; *Cuming* 1700.

Connarus trifoliolatus (*Anisostemon trifoliolatus* Turcz. in Bull. Soc. Imp. Mosc. xx., pt. 1, 152).—Luzon, Prov. Albay; *Cuming* 851.

Tephrosia purpurea Pers. Ench. ii. 329. — Luzon, Prov. Albay; *Cuming* 1257.

T. vestita Vogel in Pl. Meyen. 15. — I. of Mindanao, Misamis; *Cuming* 1621.

Uraria lagopoides DC. Prodr. ii. 324. — No precise locality; *Cuming* 1873.

Phylacium bracteosum Benn. Pl. Jav, 159, t. 33. — N. Luzon, Benguet; *Vidal.* Hitherto known only from Java.*

Alysicarpus vaginalis DC. Prodr. ii. 353. — Luzon, Prov. Albay; *Cuming* 662, 1317.

Shuteria vestita Wight et Arn. Prodr. 207.—N. Luzon, Lepanto; *Vidal.*

Glycine tomentosa Benth. Fl. Austr. ii. 244. — Luzon, Prov. Albay; *Cuming* 1238.

Dioclea reflexa Hook. f. Niger Flora, 306.—Luzon; *Cuming* 521.

Derris Cumingii Benth. in Journ. Linn. Soc. iv. Suppl. 104.—Luzon, Prov. Albay; *Cuming* 1208.

Cassia divaricata Nees in Syll. Pl. Nov. Ratisb. i. 94.—N. Luzon, Benguet; *Vidal.*

Rubus pectinellus Maxim. Diagn. Pl. Nov. Jap. x. 374.—Luzon, Prov. Tayabas; *Cuming* 806.

R. sundaicus Blume Bijdr. 1111. — Luzon, Prov. Albay; *Cuming* 750.

Rosa multiflora Thunb. Fl. Jap. 214. — N. Luzon, Benguet and Lepanto; *Vidal.* A most interesting discovery.

Hydrangea Lobbii Maxim. Revis. Hydrang. 15. — Luzon; *Lobb* (not "Java"); Lepanto; *Vidal.*

Itea macrophylla Wall. in Roxb. Fl. Ind. ii. 419. — N. Luzon, Benguet; *Vidal.*

Ceriops Roxburghiana Arn. in Ann. Nat. Hist. i. 363.—Bulacan, Prov. Bulacan; Unisan, Prov. Tayabas; *Vidal.*

Anisophyllea disticha Hook. ex Hook. f. Fl. Brit. Ind. ii. 442.—Luzon; *Lobb.*

Terminalia nitens Presl. Epim. Bot. 214.—Luzon, Prov. Albay; *Cuming* 1326.

T. pellucida Presl. *l. c.* 214. — Luzon, Prov. Albay; *Cuming* 1039.

T. polyantha Presl. *l. c.* 213.—Luzon, Prov. Batangas; *Cuming* 1516.

T. parviflora Presl. *l. c.* 214.—Luzon, Prov. Batangas; *Cuming* 1439.

T. mollis (*Pentaptera mollis* Presl. Epim. Bot. 214). — Luzon, Prov. Albay; *Cuming* 1004.

Illigera Meyeniana Kunth. ex Walp. in Pl. Meyen. 410.—Luzon, Prov. Albay; *Cuming* 685, 1112, 1306.

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* [Also from Timor, H. O. Forbes 3952 in Hb. Mus. Brit.!—Ed. Journ. Bot.]

Rhodomyrtus tomentosa Wight. Spicil. Neilgh. i. 60, t. 71. — Luzon, Prov. Albay; *Cuming* 1253.

Barringtonia luzonensis (*Stravadium luzonense* Miers Trans. Linn. Soc. ser. 2, Bot. i. 84).—Luzon, Prov. Albay; *Cuming* 653, 1268.

B. reticulata Miq. Fl. Ind. Bot. i. 494. — No precise locality; *Cuming* 1885.

Melastoma obvolutum Jack in Trans. Linn. Soc. xiv. 3.—Luzon, Prov. Albay; *Cuming* 927.

M. normale Don. Prodr. 220.—Luzon, Arayat, Prov. Pampanga; *Vidal.*

Medinilla myrtiformis Triana in Trans. Linn. Soc. xxviii. 86.— Luzon, Prov. Tayabas; *Cuming* 753.

M. Cumingii Naud. in Ann. Sc. Nat. ser. 3, xv. 292. — Luzon, Prov. Albay; *Cuming* 836.

Crypteronia leptostachys (*Henslowia leptostachys* Planch. in Lond. Journ. Bot. iv. 478).—Luzon, Prov. Batangas; *Cuming* 1464.

Jussiæa acuminata Sw. Fl. Ind. occ. ii. 745. — Luzon, Prov. Albay; *Cuming* 665, 1055.

Osmelia conferta Benth. in Journ. Linn. Soc. v. Suppl. 89. — I. of Leyte; *Cuming* 1741, 1742.

Homalium bracteatum Benth. in Journ. Linn. Soc. iv. 37. — Luzon, Prov. Albay; *Cuming* 1109.

Momordica ovata Cogn. in DC. Monogr. iii. 446. — I. of Cebu; *Cuming* 1780.

Zehneria Baueriana Endl. Prodr. Norf. I. Pl. 69.—Luzon, Prov. Batangas; *Cuming* 1542.

Melothrix leucocarpa Cogn. in DC. Monogr. iii. 601.—No precise locality; *Cuming* 1917.

Viburnum odoratissimum Ker. in Bot. Reg. t. 456. — N. Luzon, Benguet, Bontoc and Lepanto; *Vidal.*

Oldenlandia Horneriana Miq. Fl. Ind. Bat. ii. 353. — Luzon, Prov. Albay; *Cuming* 974.

Adenosacme longifolia Wall. Cat. 6280. — Luzon, Prov. Albay; *Cuming* 942.

Urophyllum memecyloides (*Cymelonema memecyloides* Presl. Epim. Bot. 210).—I. of Panay; *Cuming* 1678.

Geophila reniformis Don. Prodr. 136.—Luzon; *Cuming* 584.

Hydnophytum philippinense Becc. Malesia ii. 125. — I. of Malanipa; *Moseley.*

Rubia cordifolia L. Mant. 197. — Luzon, Prov. Tayabas; *Cuming* 788.

Blumea virens DC. in Wight. Contrib. 14.—Luzon, Prov. Albay; *Cuming* 1023, 1920.

Gnaphalium luteo-album L. Sp. Pl. ed. 1, 851. — Luzon, Prov. Albay and Batangas; *Cuming* 1025, 1459.

Melampodium divaricatum DC. Prodr. v. 520. — Luzon, Prov. Batangas; *Cuming* 1472.

Artemisia parviflora Roxb. Hort. Beng. 61.—N. Luzon, Lepanto; *Vidal.*

Senecio scandens Don. Prodr. 178. — N. Luzon, Lepanto; *Vidal.*

Cnicus Wallichii Hook. f. Fl. Brit. Ind. iii. 363. -- N. Luzon; *Vidal.*

Crepis japonica Benth. Fl. Hongk. 194. -- No precise locality; *Cuming* 1882.

Embelia Myrtillus Kurz. in Journ. As. Soc. 1871, pt. 2, 67. -- Luzon; *Lobb.*

Symplocas oblongifolia (*Carlea oblongifolia* Presl. Epim. Bot. 217). --Luzon, Prov. Albay; *Cuming* 1054.

Jasminum crassifolium Blume Bijdr. 679.--Luzon, Prov. Albay; *Cuming* 830.

J. bifarium Wall. Cat. 2866.--I. of Paragua, Batitinan; *Vidal.* -- Var. *glabra* C. B. Clarke in Hook. f. Fl. Brit. Ind. iii. 595. -- I. of Negros; *Cuming* 1790.

Ligustrum Cumingianum Dcne. in Nouv. Archiv. du Mus. ser. 2, ii. 28.--Luzon, Prov. Albay; *Cuming* 1213.

Microchites Schrieckii (*Ecdysanthera Schrieckii* Heurck. et Muell. Arg. in Pl. Nov. Heurck. fasc. 2, 191). -- Luzon, Prov. Albay; *Cuming* 910.

Parameria philippinensis Radlk. in Sitzungsb. Math. Phys. Classe R. Bav. Akad. Wiss. xiv. 518. -- Luzon, Prov. Albay; *Cuming* 1126, 1876.

P. vulneraria Radlk. *l. c.* 519.--I. of Cebu; *Rothdauscher.*

Anodendron paniculatum A. DC. Prodr. viii. 844.--Luzon, Prov. Albay; *Cuming* 1176.

Mitrasacme alsinoides R. Br. Prodr. 453.--Luzon; *Cuming* 669.

Geniostoma Cumingiana Benth. in Journ. Linn. Soc. i. 97.-- Luzon; *Lobb.* Prov. Albay; *Cuming* 864.

Fagræa fragrans Roxb. Fl. Ind. ed. Cary et Wall. ii. 32. -- I. of Paragua, Dumaran; *Vidal.*

Heliotropium strigosum Willd. Sp. Pl. i. 743. — Luzon, Prov. Albay; *Cuming* 1340.

Ipomæa reniformis Choisy. Conv. Or. 64.--Luzon, Prov. Albay; *Cuming* 1030.

Solanum Blumei Nees in Blume Bijdr. 696. — Luzon, Prov. Albay; *Cuming* 837.

Torenia peduncularis Benth. in Wall. Cat. 3956. — Luzon; *Cuming* 578.

Buchnera urticæfolia R. Br. Prodr. 437. — Luzon, Prov. Albay; *Cuming* 978.

Striga lutea Lour. Fl. Cochin, 22.--Luzon, Prov. Albay; *Cuming* 1360.

Cyrtandra oblongifolia C. B. Clarke in DC. Monogr. v. pt. 1, 206. --Luzon, Prov. Albay; *Cuming* 811.

C. incisa C. B. Clarke *l. c.* 250. -- Luzon; *Lobb, Cuming* 488, 492.

C. philippinensis C. B. Clarke *l. c.* 250. — Manila; *Perottet, Callery* 37 *bis.*

C. auriculata C. B. Clarke *l. c.* 251. -- Luzon, Prov. Albay; *Cuming* 1328.

C. Cumingii C. B. Clarke *l. c.* 263. -- Luzon, Prov. Tayabas; *Cuming* 757.

C. Lobbi C. B. Clarke *l. c.* 282.—Luzon; *Lobb.* Prov. Batangas; *Cuming* 1458.

Æschynanthus philippinensis C. B. Clarke *l. c.* 39.—Luzon, Prov. Albay; *Cuming* 813.

Dichrotrichum chorisepalum C. B. Clarke *l. c.* 53.—Luzon; *Lobb.* Prov. Albay; *Cuming* 938.

Epithema Benthami C. B. Clarke *l. c.* 180.—Luzon, Prov. Albay; *Cuming* 1265.

E. Brunonis Dcne., var. *fasciculata* C. B. Clarke *l. c.* 180. —Luzon, Prov. Albay; *Cuming* 823.

Bœa philippinensis C. B. Clarke *l. c.* 146. — Luzon, Prov. Batangas; *Cuming* 1600.

Rhynchoglossum klugioides C. B. Clarke *l. c.* 163. — Luzon, Prov. Albay; *Cuming* 824.

Lepidagathis riparia Nees in DC. Prodr. xi. 253.—Luzon, Ilocos; *Vidal.*

Polygonum perfoliatum L. Sp. Pl. ed. 2, 521. — N. Luzon, Lepanto; *Vidal.*

Kibara coriacea Hook. f. et Thom. Fl. Ind. i. 165. — Luzon, Bagag, Prov. Bataan; *Vidal.* This introduced an additional Natural Order to the Philippine Flora.

Loranthus pentapetalus Wall. Cat. 503. — No precise locality: *Cuming* 1975.

Antidesma Lobbianum Muell. Arg. in DC. Prodr. xv. pt. 2, 254. —Luzon; *Lobb.*

Mallotus floribundus Muell. Arg. in Linnæa, xxxiv. 186.—Luzon, Cagbacon, Prov. Albay; Unisan, Prov. Tayabas; *Vidal.*

Ficus sinuosa Miq. in Lond. Journ. Bot. vii. 232. — No precise locality; *Cuming* 1921, 1924.

F. copiosa Steud. Nomencl. ed. 2.—No precise locality; *Cuming* 1934.

F. rostrata Lam. Encycl. ii. 498.—No precise locality; *Cuming* 1926.

F. rapiformis Roxb. Fl. Ind. iii. 551. — No precise locality; *Cuming* 1922, 1923.

Conocephalus ovatus Trecul. in Ann. Sc. Nat. ser. 3, viii. 89. —Luzon; *Cuming* 600.

Procris grandis Wedd. in DC. Prodr. xvi. pt. 1, 193. — I. of Samar (not "Nova Guinea?"); *Cuming* 1730.

Villebrunea rubescens Blume Mus. Bot. Lugd. Bat. ii. 166. —Luzon, Lagonoy and San Fernando, Prov. S. Camarines; *Vidal.*

Debregeasia longifolia Wedd. in DC. Prodr. xvi. pt. 1, 235^{24}.—N. Luzon, Benguet; *Vidal.*

Clinogyne grandis Benth. et Hook. f. Gen. Pl. iii. 651.—Luzon; *Cuming* 465.

Liparis gregaria Lindl. Gen. & Sp. Orch. 33. — I. of Bohol; *Cuming* 2099, 2141.

Bolbophyllum penicillium Par. et Reich. f. in Trans. Linn. Soc. xxx. 151.—No precise locality; *Cuming* 2076.

B. adenopetalum Lindl. Bot. Reg. xxviii. Misc. 85.—I. of Bohol; *Cuming* 2077.

Eria fusca Blume Mus. Bot. Lugd. Bat. ii. 183. — No precise locality; *Cuming* 2118.

Rhynchostylis retusa Blume Bijdr. 286. — I. of Bohol; *Cuming* 2072, 2098.

Sarcochilus amplexicaulis Reich. f. in Walp. Ann. vi. 499. — No precise locality; *Cuming* 2056.

Appendicula xyrtiophora Reich. f. in Seem. Fl. Vit. 299. — No precise locality; *Cuming* 2149.

A. micrantha Lindl. in Ann. Nat. Hist. ser. 1, xv. 386. — No precise locality; *Cuming* 2116, 2129.

Ceratostylis retisquama Reich. f. Bonpl. 1857, 53. — No precise locality; *Cuming* 2152.

Bromheadia palustris Lindl. Bot. Reg. xxvii. Misc. 184. — No precise locality; *Cuming* 2054.

Polystachya luteola Hook. ex Wight. Ic. v. t. 1678. — Luzon; *Lobb.*

Arundina speciosa Blume Bijdr. 401. — I. of Bohol; *Cuming* 2058.

Crinum Cumingii Baker in Gard. Chron. 1881, pt. 2, 72. — Luzon, Prov. Albay; *Cuming* 1382.

Stenomeris dioscoreæfolia Planch. in Ann. Sc. Nat. ser. 3, xviii. 320.—Luzon, Prov. Albay; *Cuming* 875.

S. Cumingiana Becc. in Nuov. Giorn. Bot. Ital. ii. 8, t. 2.—I. of Leyte; *Cuming* 1739.

Scirpus articulatus L. Sp. Pl. ed. 1, 47. — I. of Mactan (near I. of Cebu); *Moseley.*

Scleria sumatrensis Retz. Obs. v. 19.—I. of Malamaui (near I. of Basilan); *Moseley.*

Panicum sanguinale L. Sp. Pl. ed. 1, 57.—Luzon; *Cuming* 561.

P. fluitans Retz. Obs. iii. 8.—Luzon: *Cuming* 532.

P. hermaphroditum Steud. Syn. Gram. 67.—Luzon; *Cuming* 554.

P. psilopodium Trin. Diss. ii. 217.—I. of Panay; *Cuming* 1667.

P. nepalense Spreng. Syst. Veg. i. 321.—Luzon; *Cuming* 553.

Ischæmum rugosum Salisb. Ic. i. t. 1.—Luzon; *Cuming* 565.

Andropogon Nardus L. Sp. Pl. ed. 1, 1046. — Luzon, Prov. Albay; *Cuming* 1000.

A. sericeus R. Br. Prodr. 201. — Luzon, Prov. Albay; *Cuming* 1398.

A. brevifolius Sw. Fl. Ind. occ. i. 209. — No precise locality; *Cuming* 1890.

Imperata ramosa Anders. in Ofvers. Kongl. Vet. Akad. Stockh. 1855, 158.—I. of Negros; *Cuming* 1801.

Miscanthus luzoniensis Anders. in Ofvers. Kongl. Akad. Stockh. 1853, 166.—Luzon, Prov. Tayabas, I. of Bohol; *Cuming* 787, 1841.

Saccharum spontaneum L. Mant. 183.—Luzon; *Cuming* 634.

Anthistiria arundinacea Roxb. Fl. Ind. i. 256. — Luzon, Prov. Albay; *Cuming* 1272.

Eragrostis zeylanica Nees ex Steud. Syn. Gram. 265. — Luzon; *Cuming* 668.

NEW FERNS FROM BRAZIL COLLECTED BY DR. GLAZIOU.

By J. G. Baker, F.R.S.

The following new ferns are contained in a parcel received lately from the indefatigable Dr. Glaziou, collected partly in the sylvan region in the neighbourhood of Rio Janeiro, and partly in the central region of Brazil, about Caraca and Ouro Preto:—

51.***Adiantum Senæ,** n. sp. — Stems densely tufted, very slender, short, naked, castaneous. Frond simply pinnate or sparsely bipinnate, lanceolate or lanceolate-deltoid, $1\frac{1}{2}$–2 in. long, bright green, glabrous; main rachis very slender, naked, zigzag, castaneous. Lower pinnæ largest, with at most only 3–4 distant segments. Segments remote, shortly petioled, at most $\frac{1}{8}$ in. long and broad, cuneate and entire in the lower half, rounded and more or less deeply lobed on the margin of the upper half. Veins flabellate, distant, distinct. Sori orbicular, at most 3–5 to a segment. Indusium pale drab, glabrous, membranous, persistent. —*Glaziou* 15723! Intermediate between *tremulum* and the dwarf forms of *cuneatum*, but much less compound than the latter. Named, at the request of Dr. Glaziou, after Mr. Joaquim de Costa Sena, Professor of the Mineralogy and Geology at the School of Mines at Ouro Preto.

187.***Nephrodium** (Eunephrodium) **devolvens,** n. sp.—Stipes 4–6 in. long, slender, grey, fragile, naked. Frond oblong-lanceolate, 15–18 in. long, 5–6 in. broad, bipinnatifid, membranous, green and finely hairy on both surfaces; rachis grey, straight, fragile, pubescent. Pinnæ numerous, lanceolate, sessile, truncate at the base, those of the centre and base of the frond all about equal in length, 3–4 in. long, $\frac{3}{4}$–1 in. broad, cut half-way down to the midrib into parallel oblong segments $\frac{1}{6}$ in. broad; lower pinnæ very much deflexed and narrowed on both sides towards the base. Veins pinnate, 8–9-jugate, simple, about the two lower pairs anastomosing at the tip. Sori small, round, medial. Indusium small, inconspicuous, membranous, pilose.—*Glaziou* 15766! Intermediate between *N. molle* and *refractum*.

35.***Polypodium** (Phegopteris) **myriotrichum,** n. sp.—Stipe 8–12 in. long, flexuose, bright brown, densely pilose, with a large tuft of linear yellowish brown crisped basal paleæ. Lamina oblong-lanceolate or oblong-deltoid, 12–18 in. long, 4–10 in. broad at the middle, tripinnatifid or tripinnate, dull green, moderately firm in texture, densely hairy on both surfaces and all the rachises. Lower pinnæ many subequal, lanceolate or oblong-lanceolate, 2–4 in. long, lowest much reflexed; final segments oblong, obtuse, contiguous, faintly crenate, 1-12th in. broad. Veins sparingly pinnate in the final segments. Sori globose, subcostular. — *Glaziou* 15734! Recalls in general habit the most hairy forms of *Lonchitis pubescens*.

Anemia oblongifolia Sw. — Besides the type, Dr. Glaziou sends two striking varieties, *lanosa*, with leaves of coriaceous texture, leaflets of the basal leaves 7–8-jugate, base of the tuft enveloped in a dense tuft of red-brown fine hair-like paleæ half an inch long, and peduncle and leaf-rachis densely clothed with spreading soft brown hairs (*Glaziou* 15795); and *microphylla*, with small membranous leaves, with 3–7 orbicular segments, a very long slender nearly naked peduncle below the forking of the fertile stem, and its much-reduced leaf and the hair-like paleæ enveloping the base of the stem very short.]) He has also re-gathered recently the following very rare species,/ *viz.*:—

15776, 15777. *Cyathea vestita* Mart.
15732, 15733. *Cassebeera pinnata* Kaulf.
15727. *Adiantum sinuosum* Gardn.
15728. *Pteris ornithopus* Mett.
15736. *P. viscosa* Moore.
15758. *Nephrodium acutum* Hook.
15760. *N. Gardnerianum* Baker.
15735. *Notholæna Pohliana* Kunze.
15737. *Gymnogramme Sellowiana* Mett.
15796. *Trichopteris elegans* Gardn.
15788. *Anemia dichotoma* Gardn.
15787. *A. millefolia* Gardn.

PELORIA IN *HABENARIA BIFOLIA* Br.

By H. N. Ridley, M.A., F.L.S.

Mr. Boulger has lately put into my hands a curious monstrosity of *Habenaria bifolia* Br., in which the lip is exactly similar in form, texture, and size to the petals, and there is no trace of any spur. This occurs in every flower on the spike. Although I am not acquainted with any similar instance in this genus, it is not unknown in other genera, such as *Cattleya* and *Lælia*. There is a figure of a similar monstrosity in *Cattleya pumila* in the 'Gardeners' Chronicle,' May 9th, 1885, p. 597, and it is most probable that *Paxtonia rosea* is a peloriated form of a *Spathioglottis*. But there is a point of greater interest in some of the flowers of the *Habenaria*. From the base of the column arise two white foliaceous bodies, ovate, oblong, and obtuse, curved up in front of the column. These are doubtless the stigmatic lobes, which are never normally developed into processes in any of our British Orchids; but in many of the Habenarias of tropical countries, such as *H. macroceras* of S. America and West Indies, they take the form—as in this monstrosity—of flattened foliaceous organs, or of terete arms of greater or shorter length. This malformation may thus be set down as an instance of reversion to an older type.

The genus *Platanthera* being now reduced by Mr. Bentham to a section of *Habenaria*, from which genus, indeed, it is impossible to separate it by any definite characters, it becomes necessary to alter the generic name *Platanthera*. It is customary in such cases to preserve the old specific name where possible; and with respect to our British species this is satisfactory in every case but one, *viz.*, *Platanthera chlorantha* Curt. (*Orchis bifolia* Richard), *O. virescens* Gaud., *O. ochroleuca* Ten., *P. Wankelii* Rchb. f., *P. montana* Rchb. f., *Habenaria chlorantha* Babington. Unfortunately the last stands for a Mauritius plant with really green flowers, described by Sprengel (Syst. Veget. iii. p. 691), so a new name must be imposed; and I propose that of *Habenaria chloroleuca* for the plant, which describes the actual colour of the flowers more satisfactorily than *chlorantha*. The remaining British plants now included in the genera are—*H. bifolia* R. Br. = *P. solstitialis* Bnngh.; *H. conopsea* = *Gymnadenia conopsea* R. Br.; *H. albida* R. Br. = *Gymnadenia albida* Rich, *Peristylus albidus* Lindl., *Leucorchis albidus* Mey.; *H. viridis* R. Br. = *Cœloglossum viride* Hartm., *Platanthera viridis* Ldl.; *H. intacta* Benth. = *Tinæa cylindracea* Biv., *Satyrium maculatum* Desf., *Orchis intacta* Lk., *Aceras densiflora* Boiss., *A. intacta* Rchb. f., *Neotinea intacta* Rchb. f., *Himantoglossum secundiflorum* Rchb. f.

SHORT NOTES.

Note on the Algo-Lichen Hypothesis. — In addition to the various direct and indirect arguments which have been adduced against this theory, another, and in some respects a still more convincing proof, has quite recently been brought under notice by Dr. Nylander in 'Flora' (1885, p. 313). In his observations upon *Gyalecta lamprospora* Nyl., a new species from North America collected by Mr. Willey, of which a full diagnosis is given, he writes:—"Each gonidium of this *Gyalecta* is distinctly seen to emit from its thickish cellular wall (as do also the young gonidia) a firm medullary filament, and often two such filaments, characteristic of the nature of lichens. It is most manifest that these licheno-hyphæ are productions, and indeed continuations, of the cellular wall of the gonidium itself." In the species under notice it may be mentioned that the thallus is not corticated, and that the gonidia are most frequently chroolepoidly seriated and moderate. Now this very important discovery of the veteran and distinguished lichenist is, beyond all question, sufficient of itself at once to disprove Schwendenerism in all its phases. For if the gonidia thus send forth filaments in the manner stated, then the gonidia clearly cannot be algals; and if licheno-hyphæ are thus produced by the gonidia, then these hyphæ as clearly cannot be parasitic fungal mycelia. On these grounds alone (apart from other considerations) this plausible hypothesis necessarily collapses, and "symbiosis" is seen to be but a mere fable.—J. M. Crombie.

Schœnus ferrugineus L. in Britain. — As it is not impossible that, if looked for, the plant may be found elsewhere in Britain, it seems desirable to lose no time in recording the occurrence of *Schœnus ferrugineus* L. in Perthshire. The specimens before me were collected beside Loch Tummel, in July last, by my friend Mr. Brebner; but it is only now that, in beginning an examination of the Perthshire *Cyperaceæ*, I have determined the species. From its European distribution—from Scandinavia southwards to S.E. France, and eastwards to Thrace and Middle Russia—*S. ferrugineus* was a species not unlikely to occur in Britain. Though bearing a certain resemblance to *S. nigricans*, it is abundantly distinct from that species. As my specimens are not in fruit, I reserve a full description till I have an opportunity of visiting the locality where Mr. Brebner found the plant. In the meantime, however, I may indicate some of the points of difference between it and *S. nigricans*. In the first place *S. ferrugineus* is more slender in all its parts than *S. nigricans*, and as the spike has generally only two spikelets, and often only one, it is narrow and oblong rather than obovoid. In the second place the lower bract is only about as long as, or a little shorter than, the spike, and its subulate point is erect instead of oblique. In the third place the dorsal keel of the glumes is either quite smooth or, more rarely, very slightly rough. The Loch Tummel specimens, which much resemble German and Swiss specimens in my herbarium, are from seven to eleven inches long, and have very short leaves.—F. BUCHANAN WHITE.

FERNS NEW TO N. S. WALES. — In a collection of ferns made recently near Illawarra, S. Australia, which Mr. Baker has kindly named for me, are three species—*Nephrodium hispidum* Hook., *Hymenophyllum multifidum* Sw., and *H. varium* Br., not hitherto recorded for the colony.—JOSEPH REDFORD.

NEW ANGLESEY STATION FOR CHAMAGROSTIS MINIMA.—I have just received specimens of this grass, collected this month, from a station in Anglesey not previously reported, namely, at Rhôs-neigir, in the neighbourhood of Cymmeran Bay. The only other Anglesey station for this plant is on the western side of Llyn Coron, a small lake about half a mile long, close to the Bodorgon station, on the Chester and Holyhead Railway. The new locality for this rare British grass is about five miles in a north-westerly direction from Llyn Coron, and for its discovery we are indebted to Mrs. John Plant, the wife of the Curator of the Peel Park Museum, Salford.—CHARLES BAILEY.

BEDFORDSHIRE PLANTS. — In the excellent list of Bedfordshire plants given by Mr. James Saunders in this Journal for 1883, *Papaver hybridum* L. finds no place. It has grown in the chalky corn and clover fields, close to the base of the hills, by the downs to the west of Dunstable, and has grown there for many years. Abbot speaks of the plant as common in Bedfordshire. *Papaver Argemone* L. grows with it, and is the more abundant of the two. *Cephalanthera grandiflora* Bab., stated to be rare by Abbot and Mr. Saunders, grows in the northern section of the long plantation of beeches, firs, and larches bordering the Roman Road on the west of Dunstable. This locality is not given by either of the authors mentioned.—W. G. SMITH.

CREPIS TARAXACIFOLIA IN MIDDLESEX.—Early in June I gathered *Crepis taraxacifolia* in several places between Hampton Court and

Kingston Bridge. It is especially abundant opposite the Waterworks. This plant does not appear to have been met with hitherto in Middlesex.—JOHN BENBOW.

CAREX PARADOXA Willd. IN CAMBRIDGESHIRE. — This interesting addition to the flora of Co. 29 grows in profusion in Wicken Fen. It is somewhat remarkable that neither it nor any allied form seems to have been recorded from this well-worked locality; and the fact of its being spread over a considerable tract of the fen may stimulate botanists to re-examine other districts of which the flora seems to be thoroughly known.—ALFRED FRYER.

NOTICES OF BOOKS.

Die Hieraeien Mittel-Europas. Monographische Bearbeitung der Piloselloiden mit besonderer Berücksichtigung der mitteleuropäischen Sippen. Von C. v. NÄGELI und A. PETER. München: Oldenbourg. 1885. 8vo, pp. xi. 931.*

THE appearance of this long-expected book will be highly welcome to every lover of plants. So classical a work requires no recommendation to a botanical public; but it is worthy of perusal by every natural scientist, although he may have no intention of making a special study of the Hieracia.

The mass of matter in the book is enormous; in the course of more than twenty years' labour the authors acquired a knowledge of such an immense number of forms distinct and constant, of every gradation, that in order to prevent its assuming colossal proportions they were compelled to discard a certain number: nevertheless the number of distinct species amounts to 164; to most of them a larger or smaller number of subspecies, varieties, and subvarieties are attached, so that the grand total of described forms—"kindreds," as the author calls them—is 2000. To have examined this vast accumulation of material, to have carefully sifted and arranged it, and at last described it all in the clearest manner, so that everyone who does not fight shy of serious study may have at hand a sure and safe guide into the region of these forms, is the chief merit of this mighty work—a true monument of German scientific industry at which no one will withhold his astonishment who knows what labour of the kind really signifies.

The arrangement of the systematic portion is as follows:—The subgenus *Pilosella* is in the first instance divided into *acaulia* and *cauligera;* next the *acaulia* are subdivided into two, and the *cauligera* into seven sections; in each of these sections are the chief or typical species as characteristics; then follow the intermediates and hybrids—those first which are within the section, next those connected with the preceding one. The subspecies of the polymorphic kinds are then for perspicuity's sake collected together into groups (*greges*). A systematic conspectus and a determining table at the end of the book serve to facilitate the survey and the study of it: a separate section determines the characters of the dried specimens supplied from various collectors; the most considerable collection is that of Peter himself, consisting of 300 in number.

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* We are indebted to Dr. E. de Crespigny for this translation of Dr. E. Hackel's review of this work, which appeared in the 'Oesterreichische Botanische Zeitschrift' for May last.

Thus far we have been occupied with the systematic divisions only, of value to the botanist especially; the other divisions are more generally interesting. First of all the morphology of the various groups is treated of, their innovation, relations, and certain biological characteristics indicated; then the various points discussed bearing upon their behaviour under cultivation, those which are constant distinguished from those which are variable, and so forth. In the section headed "The species and its component parts" it is shown that the kindred forms are of unequal systematic value, and that the species consists partly of individual kindred forms and partly of groups of them; and an attempt is made to explain in graphic demonstrations by means of divers examples the phytogenetic origin of the kindred forms through variation and divergence, and the influence exercised by the dying-out of them. With regard to the systematic treatment of the subject, it is affirmed that not all the kindred forms connected with each other by intermediate links are to be considered as constituting a species, because in that case the first and the last members of the series would be less related to one another than to many others not connected by kindred ties in cases where an hiatus occurs from accidental circumstances, *viz.*, extinction.

The manifold relations of the series one to another are represented by several graphic illustrations. Further, an attempt has been made to settle the manner in which the individual characters have philogenetically developed themselves; which of them are of recent, which of earlier origin, thus indicating a pedigree, as it were, of the Piloselloids. The multiplication of forms through hybrids is particularly treated of; and it is pointed out that in this way no new phenomena are produced, but only new combinations of characters already existent; and that the kindred form conditions are scarcely altered, because of their rare occurrence. For the rest, the hybrids in the work before us are considered as intermediate forms, and designated individually by name. The chapter on geographical distribution will be read with especial interest, for it is not confined to the Piloselloids, but gives us a sketch of the origin of the Central European Flora in general. Particular sections are devoted to the means for working at monographs, literature, collections, travels, cultivation, method of work, and an account of nomenclature. As the views of systematists with regard to the systematic value of the kindred forms distinguished by the authors may vacillate, a non-recurrent name has very properly been given to every subspecies and important variety.

Of course it is not every systematist who will coincide with the ideas of species entertained by the authors. If the views of the authors that the gaps between existing species are to be explained by the extinction or dying-out of the intermediate forms—and therefore by an accidental occurrence—be correct, then of course there would be nothing to object to in their proceedings as regards the exclusion of intermediate forms from a series of graduated transitions between two species, which would not then be sharply defined on either side; for if the intermediate forms of the species now isolated had not died out, they would have to be included with the others in the same girdle; and if, for example, all the forms which have ever originated in the genus *Hieracium* were still in existence, the distinction of species generally would be nothing more than an arbitrary cutting-up of the network of forms into approximately equal-sized portions. At least the views of the authors tend to this conclusion; for they see in those minute variations, as they occur so multifariously in the *Hieracia* especially, the beginnings of species-formation, and believe that these have always commenced with small steps of the kind, and that existent gaps in the series are explicable simply by the dying-out process.

We are well aware that these views—also entertained by Darwin—are prevalent among the majority of enquirers; nevertheless we would remind them that they are, after all, mere speculations to which facts cannot always be tacked on without force. Experience indicates rather that species-formation is not always consequent upon small gradations, but that at all times and perhaps in certain seasons more rapid transformations have taken place; so that we might even, with O. Heer, speak of a species *metamorphosis*. In this light the gaps between the isolated species would acquire a higher significance, and one could no longer consider these fragments of a closely woven circle of forms originating in very small steps of variation as their equivalents in value. Want of space unfortunately prevents us from going deeper into these matters, besides which such purely theoretical notions have no bearing upon the practical value of the book under consideration. As regards the form of it, it may seem rather strange that Latin, sometimes by itself and sometimes together with German, is used for the diagnoses of the species and of the groups, while for the subspecies and varieties only German is employed. We think the adoption of one language would have been more appropriate. The book is admirably got up.

New Books.—A. Jansen, 'Jean Jacques Rousseau als Botaniker,' (Berlin, Reimer: 8vo, pp. vi. 308.)—A. V. Cornil & V. Babes. 'Les Bactèries et leur role dans l'anatomie et l'histologie pathologique des maladies infecteuses.' (Paris, Alcan: 2 vols. 8vo. pp. viii. 696, tt. 27).—H. Fol, 'Les Microbes.' Geneva, Georg: 4to, pp. 54, tt. 5).—F. Rochas, 'Les Schizophytes.' (Geneva, Georg: pp. 27).—J. C. Brown, 'Forests and Forestry in Poland, Lithuania, the Ukraine, and the Baltic Provinces.' (Edinburgh, Oliver & Boyd: pp. viii. 276).—S. Artault, 'Glossologie Botanique.' Paris, O.-Henry: 12mo, pp. 328).—G. Hauser, 'Ueber Faulnissbacterien und deren Beziehungen zur septicämie.' (Leipzig, Vogel: 8vo. pp. 94, tt. 15).—A. Paillieux & D. Bois, 'Le Potager d'un Curieux.'

(Paris, 26 Rue Jacob: 8vo, pp. 294.).—O. BEHRENDSEN, 'Grundzüge der Botanik' (Halle, Niemeyer: 8vo, pp. viii. 198: 65 cuts).

ARTICLES IN JOURNALS.

Ann. & Mag. Nat. Hist. — R. Kidston, 'Fossil Plants collected from Lanarkshire Coal-field.'

Botanical Gazette (May). — E. Koehne, 'Lythraceæ of United States' (1 plate). — (June). Autobiography of A. Fendler. — G. A. Rex, 'The Myxomycetes—their collection and preservation.' — L. H. Bailey, Jun., 'Notes on *Carex*.' — G. Vasey, *Deyeuxia Macouniana*, sp. n.

Bot. Centralblatt. (Nos. 22–25).—A. Hausgirg, 'Ueber den Polymorphismus der Algen.'

Bot. Zeitung (May 29, June 5, 12). — A. v. Lengerken, 'Die Bildung der Haftballen an den Ranken einiger Alten der Gattung Ampelopsis' (1 plate).

Bull. Torrey Bot. Club (April). — C. H. Peck, 'New Fungi' (*Boletus sphærosporus*, sp. n., and many micro-fungi: 1 plate).

Contemporary Review (May). — Sir J. Lubbock, 'On Leaves' (34 cuts).

Gardeners' Chronicle (May 30).—*Coelogyne lactea* Rchb. f., *Saccolabium coeleste* Rchb. f., spp. nn. — W. G. Smith, 'Diseases of Orchids as caused by Fungi' (*Trichobasis Lynchii*, fig. 154). — (June 6). *Vanilla Humblotii*, *Angræcum rostellare*, *Aeranthus Leonis*, *Pogonia Barklyana*, spp. nn., all of Rchb. f. — *Bassia Erskinenana* F. Muell., sp. n. — Fruit of *Lycaste Skinneri* (fig. 166). — W. B. Hemsley, 'Insular Distribution of Orchids.'—(June 13). *Angræcum florulentum* Rchb. f., *Eulophia megistophylla* Rchb. f., *Anthurium inconspicuum*, N. E. Br., spp. nn. — *Adiantum Novæ-Caledoniæ* (fig. 173); *Saxifraga media* (fig. 177). — (June 20). *Oncidium ludens* Rchb. f., *Cyrtopodium Saintlagerianum* Rchb. f., spp. nn.

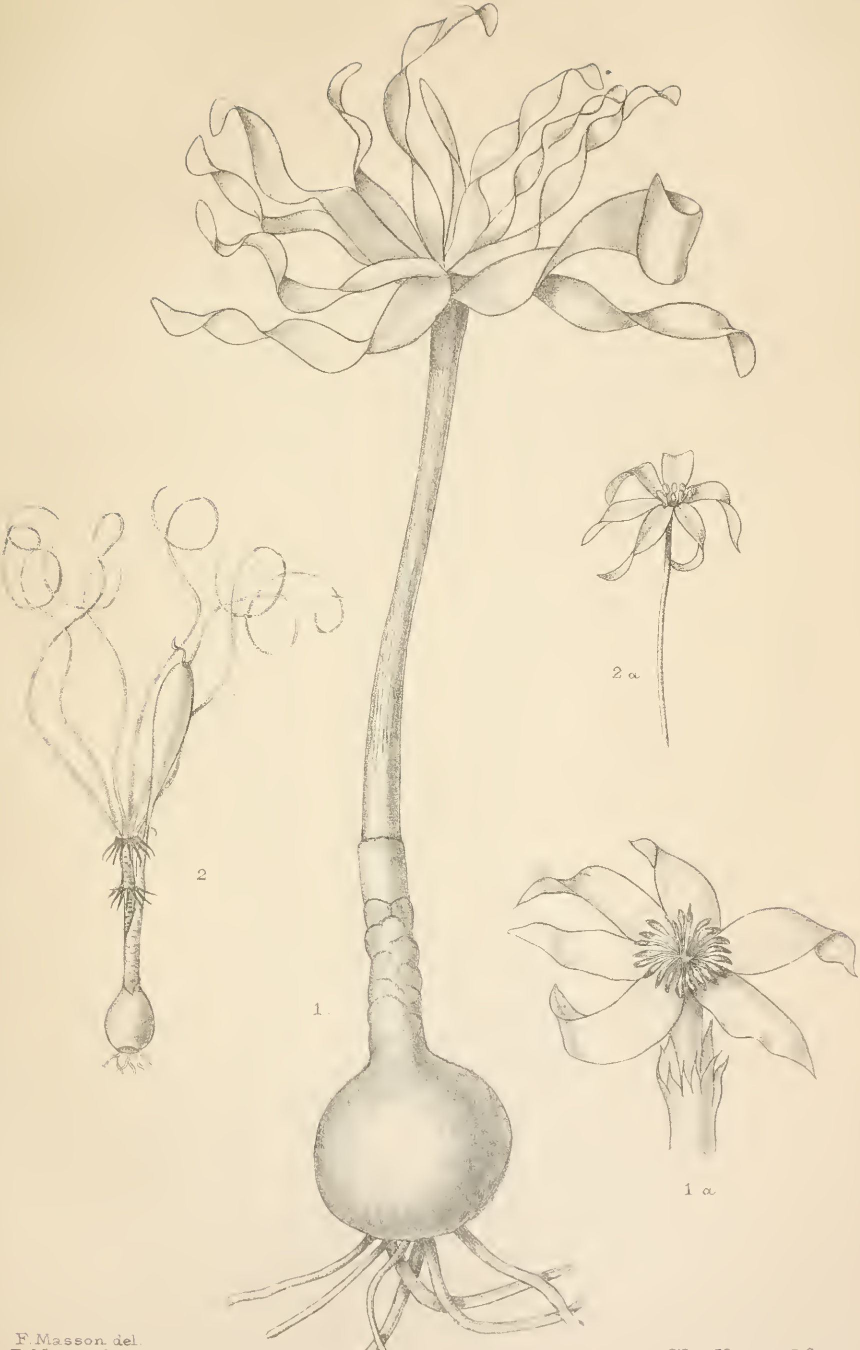
Grevillea.—M. C. Cooke, 'New British Fungi.'—Id., 'Synopsis Pyrenomycetum' (contd.). — Id. & Harkness, 'Californian Fungi.'

Midland Naturalist. — W. Hillhouse. 'Intercellular relations of Protoplasts' (contd.).

Œsterr. Bot. Zeitschrift. — L. Celakovsky, '*Dianthus dalmaticus*, n. sp.' — D. C. Schiedermayr, 'Kryptogamen Flora von Tirol.' — R. v. Weltstein, 'Pilzflora der Bergmerke' (*Agaricus Styriacus*, *Panus tenuis*, *Arcyria Winteri*, spp. nn.). — E. Formánek, 'Flora des böhmisch-mährischen Schneegebirges' (contd.).

Pharmaceutical Journal (June 6). — H. Groves, 'Hints for beginners of Botanical Collections' (concluded).

Tab. 259.

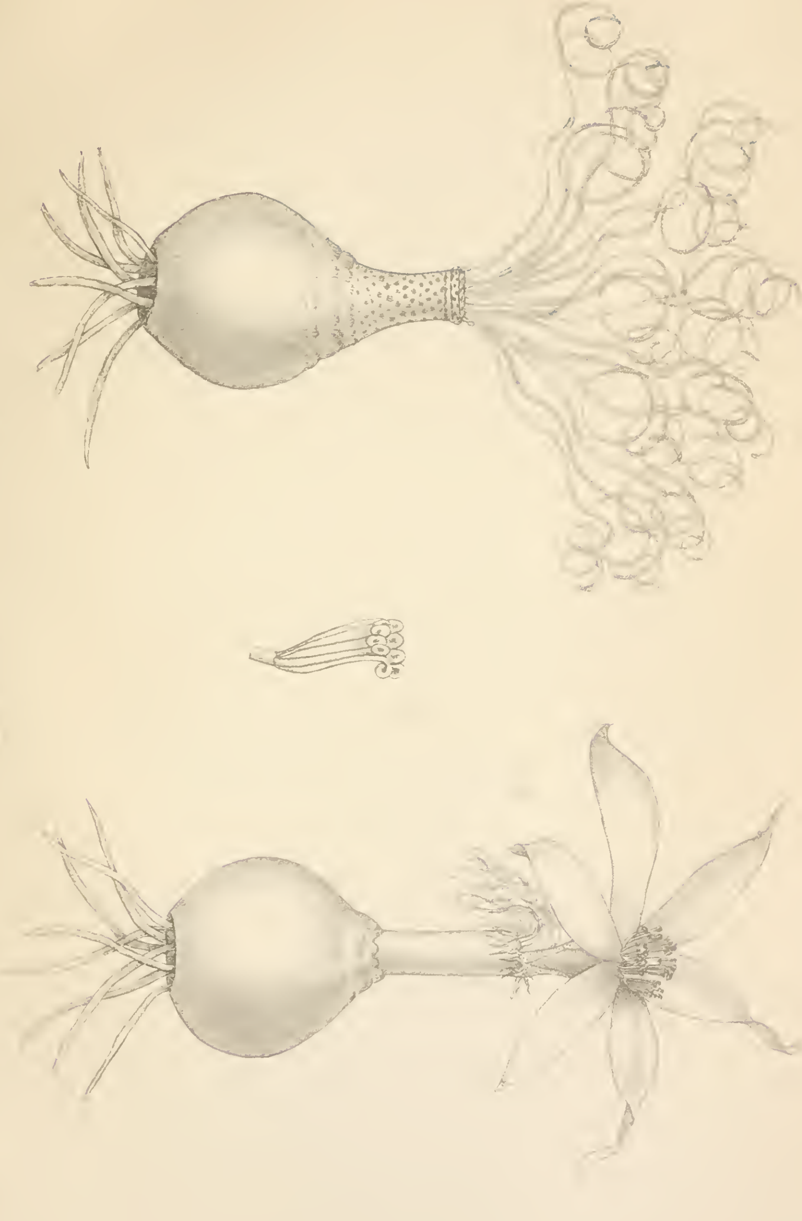


F. Masson del.
R. Morgan lith.

West, Newman & Co imp

1 Gethyllis latifolia *Masson*. 2 G. verticillata *R. Br.*

Tab. 260.



Gethyllis Britteniana, Baker.

Massee del. F. Morgan lith.

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A MONOGRAPH OF THE GENUS *GETHYLLIS*.

By J. G. Baker, F.R.S.

(Plates 259, 260.)

The Massonian drawings of *Gethyllis*, which I have just had the pleasure of studying at the British Museum, add very materially to our knowledge of the genus. So far as I am personally concerned their discovery at this present juncture is most timely and satisfactory, as I have been busily engaged this winter in working out the Amaryllidaceæ for my colleague Mr. Thiselton Dyer's continuation of Harvey and Sonder's 'Flora Capensis.' The genus is very poorly represented in the London herbaria, and but little better in that of Thunberg, of which, through the kindness of the authorities of the Museum at Upsala, I had the loan some time ago. The flowers are very fugitive, and, as they appear at a different time of year from the leaves, it is a task of much doubt and difficulty to sort out properly the dried specimens. As this series of drawings by Masson contains full sketches of seven out of nine species, two of them entirely unknown before and two others described from the leaves alone, it advances our knowledge of the genus very considerably.

Key to the Species.

Stamens six.
Style falling short of the tip of the perianth-segments.
Leaves glabrous, spirally twisted from the base upwards. 1. *G. spiralis.*
Leaves glabrous, rolled back spirally towards the tip. 2. *G. verticillata.*
Leaves densely hispid . . . 3. *G. villosa.*
Style exserted and declinate . . . 4. *G. longistyla.*
Stamens numerous.
Leaves linear, glabrous, spirally twisted.
Stamens 9–12 . . . . . . 5. *G. afra.*
Stamens in 6 bundles, several in each bundle. 6. *G. Britteniana.*
Leaves linear, hairy . . . . 7. *G. ciliaris.*
Leaves lanceolate, very much crisped . 8. *G. undulata.*
Leaves lorate, glabrous, twisted . . 9. *G. latifolia.*

1. G. spiralis Linn. fil. Suppl. 198.*—Bulb globose, 1–1¼ in. diam.; tunics produced 1–2 in. above its apex. Leaves 4–6, produced after the flowers, linear-subulate, glabrous, spirally twisted from the base upwards, 4–6 in. long. Perianth-tube 2–3 in. long; limb 1–1½ in. long, whitish, tinted red on the outside; segments oblong-lanceolate, ¼–⅓ in. broad at the middle. Stamens 6, about ½ in. long; filament equalling the anther. Style straight, rather

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* [The three species of Linn. fil. in Suppl. were also published by Thunberg in the same year (Nov. Gen. 14).—Ed. Journ. Bot.]

overtopping the anthers. Fruit clavate, 2–3 in. long, under ½ in. diam., narrowed to the base. Thunb. Nov. Gen. 14; Prodr. 59; Flora Cap. edit. ii. 302; Bot. Mag. t. 1088; Herb. Amaryll. 185; Kunth Enum. v. 695.—*Papiria villosa* Thunb. in Act. Lund. i. 2, 111.

Hab. South-western Provinces, *Thunberg*! *Masson*! *Burchell*! *Harvey* 864! *Cooper* 1644! 1710! *Rev. W. M. Rogers*! *Hort. Trevor Clarke*! *Wallich* 407! 452! Flowers at the Cape in December and fruits in February.—*G. rosea* Eckl. Topog. Verz. 4, is a small form with a red-tinted perianth-limb.

2. G. VERTICILLATA R. Br. Prodr. 290 (Tab. 259, fig. 2, reduced one-half). — Bulb small, ovoid, with a spotted cylindrical neck 1–2 in. long. Leaves 4–5, linear-subulate, glabrous, not twisted spirally, but rolled-up like a watch-spring towards the tip, 4–6 in. long. Perianth pure white; tube slender, 3–4 in. long; segments lanceolate, acute, reflexing, an inch long. Stamens 6; filaments filiform, as long as the anthers. Style a little overtopping the stamens. Fruit yellow, clavate, cotemporary with the leaves, 1½ in. long, ⅓ in. diam. Roem. et Schultes Syst. Veg. vii. 781; Herb. Amaryll. 186, tab. 26, fig. 6; Kunth Enum. v. 697.

Hab. South-western District; Piquetberg, year 1790, *Masson*!

3. G. VILLOSA Linn. fil. Suppl. 198.—Bulb small, ovoid; tunics produced an inch or more above its apex. Leaves 5–10, developed after the flowers, linear, 2–3 in. long, ⅙ in. broad, twisted spirally, clothed with dense ascending or deflexed whitish bristly hairs. Perianth-tube pilose, 2–4 in. long; limb tinged with pink, about an inch long; segments lanceolate, reflexing, ⅙ in. broad. Stamens 6, one-third the length of the perianth-segments; anthers about as long as the filaments. Style straight, reaching to the top of the stamens. Fruit clavate, yellowish, cotemporary with the leaves, 2 in. long, ⅓ in. diam. Thunb. Nov. Gen. 14; Prodr. 59; Fl. Cap. edit. ii. 303; Willd. Sp. Plant. ii. 104; Herb. Amaryll. 186; Kunth Enum. v. 697. — *Papiria villosa* Thunb. in Act. Lund. i. 2, 111, cum icone.

Hab. South-western Provinces, *Thunberg*! *Masson*!

4. G. LONGISTYLA Bolus in Journ. Linn. Soc. xviii. 396.—Bulb ovoid or subglobose; inner tunics pale reddish, produced some distance over its apex. Leaves 12–18, produced after the flowers, linear from a dilated base, acuminate, ciliated, 3–4 in. long, ¼ in. broad, covered with linear white lacerated centrally-affixed scales. Perianth-tube 2 in. long; segments oblong-lanceolate, acuminate, about an inch long, ¼ in. broad. Stamens 6, about ½ in. long; anther longer than the filament. Style exserted ½–⅝ in. beyond the tip of the perianth-segments, stout, subangular, thicker gradually towards the base.

Hab. Sneewbergen Range, alt. 4000 ft., *Tyson* (*Bolus* 842).

5. G. AFRA Linn. Sp. Plant. 633.—Bulb globose, 1½–2 in. diam., with brown membranous tunics produced 2–3 in. over its apex. Leaves 12–20, as long as the flowers, linear, twisted, strongly ribbed, glabrous. Perianth-tube 3–4 in. long; limb whitish, 1½–2 in. long; segments oblong or oblanceolate-oblong, acute, varying from ⅓ to ¾ in. broad. Stamens 9–12, about ½ in. long;

anthers equalling the filaments. Style straight, rather overtopping the anthers. Fruit yellowish, clavate, edible, with an agreeable scent. Lindl. Bot. Reg. t. 1016; Roem. et Schultes Syst. Veg. vii. 780; Herb. Amaryll. 185; Kunth Enum. v. 696.

Hab. Southern Provinces, *Burchell* 7209! *Zeyher* 1663!

6. **G. Britteniana**, n. sp. (Tab. 260, reduced two-fifths).—Bulb globose, 2–3 in. diam., with a thick spotted neck, 1½ in. long. Leaves 12–15, linear, glabrous, firm in texture, spirally twisted, 4–6 in. long, 1-12th to 1-8th in. broad. Perianth pure white; tube stout, 2–3 in. long, its base hidden by a sheathing membranous bract; segments oblong-lanceolate, 2 in. long, ¾ in. broad. Stamens very numerous, arranged in 6 clusters; filaments about as long as the anthers.—*G. bivaginata* Masson MSS.

Hab. Konradenberg, *Wallich* in Hb. Mus. Brit.! Karoo, Sept. 1793, and Hort. Masson, 1794. I have described this from Masson's three sketches, and named it after Mr. Britten, to whom we are indebted for seeking out and rendering available for use the series of drawings by Masson on which my paper is so largely founded.*

7. G. CILIARIS Linn. fil. Suppl. 198. — Bulb globose, 1½ in. diam., with the tunics produced beyond its apex in a cylindrical sheath 4–5 in. long. Leaves 20 or more, produced after the flowers, linear, spirally twisted, conspicuously ciliated. Perianth-tube 2–3 in. long; limb whitish, 1½ in. long; segments oblong-lanceolate, ⅓–½ in. broad. Anthers numerous, linear, ¼–⅓ in. long; filaments very short, confluent. Style straight, not longer than the stamens. Fruit clavate, yellow, 2–3 in. long, above ½ in. diam. Nov. Gen. 14; Prodr. 59; Fl. Cap. edit. ii. 302; Jacq. Hort. Schoen. i. 41, t. 79; Herb. Amaryll. 185; Kunth Enum. v. 696.—*Papiria ciliaris* Thunb. in Act. Lund. i. 2, 111. — *G. polyanthera* Solander MSS.

Hab. Southern Provinces, *Thunberg*! *Masson*! Jacquin describes this species as having six filaments, with three anthers to each. There is a single flower in Thunberg's herbarium, marked *G. cuspidata*, with six filaments, with two anthers to about two of them, and one only to the others. Solander's full original description will be found in Mr. Britten's paper in Journ. Bot. 1884, p. 148.

8. G. UNDULATA Herb. Amaryll. 186, tab. 25, fig. 5. — Bulb globose, 2–3 in. diam., with a neck 2–3 in. long. Leaves 12–20, lanceolate, spreading, villose, much undulated, 5–6 in. long, ⅓–½ in. broad. Perianth pure white; tube stout, 2–3 in. long; segments oblong-lanceolate, 1½ in. long. Stamens numerous; filaments short, filiform. Style not much overtopping the stamens. Kunth Enum. v. 697.

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* [These drawings, with others to the number of nearly 100, were presented to the Department of Botany by Mr. Charles Lee, son of Mr. John Lee (inadvertently called James on p. 123 of Journ. Bot. 1884), and great-grandson of the James Lee of Hammersmith to whom they were sent by Masson. My own share in the discovery is really confined to the interest which it was fortunate enough to excite in the Messrs. Lee, who were good enough to institute a renewed search for the drawings, with gratifying results. — ED. JOURN. BOT.]

Hab. South-western District; Zee Koe Valley, March, 1794, *Masson*!

9. **G. latifolia** Masson MSS. (Tab. 259, fig. 1, reduced one-half).—Bulb globose, ½ in. diam., with a cylindrical neck 8–9 in. long. Leaves 10–12, spreading, lorate, twisted, glabrous, 4–5 in. long, ½ in. broad. Perianth-tube stout, 2–3 in. long; segments pinkish, oblong-lanceolate, acute, 2 in. long, ½ in. broad. Stamens about 20, all distinct, ¼–⅓ in. long; filaments filiform, as long as the anthers.

Hab. South-western District, Meerhof's Casteel, Sept. 1793. *Hort. Masson*, fl. Feb. 1794. Described from Masson's drawing.

BOTANICAL NOTES ALONG THE RIVERS NORE, BLACKWATER, &c.

By Henry Chichester Hart.

The River Nore rises on the northern flanks of the Devil's-bit range of mountains in the north-east of Tipperary. Flowing north of east to near the middle of the Queen's County, it then turns south and makes its way through the County Kilkenny to meet the Barrow near New Ross. The union of the two rivers forms the northern arm of the Waterford Estuary.

On the 5th July, 1884, my friend and I left Templemore, and came on the Nore at the base of the hills in which it takes its source. For the first few miles no plant of rarity was gathered. Bee Orchis was in flower in two or three places, and several gay species decorated the hedges and river banks of this rather uninteresting country. These were chiefly *Hypericum Androsæmum*, *Viburnum Opulus*, *Eupatorium cannabinum*, and *Orchis pyramidalis*. Elder and twayblade (*Sambucus nigra*, *Listera ovata*), are also abundant species. *Juncus glaucus* not infrequent.

The river here flows over an ancient oak-forest, its bed being full of contorted arms, stems, and roots, *in situ*: these lie beneath thick beds of turf, through which the water has cut its channel. Ere long the turf disappears, and we come on rich soil lying on rounded glacial gravel deposit, on which the river-bed now lies. Great beds of *Potamogeton natans* usurp the stream, and labourers with scythes are at work mowing the pond-weed beneath the water. For a considerable space they have to do this annually. The fall of the river is so slight that any impediment to the stream produces stoppages and a flood.

Near Borris-in-Ossory, *Apargia hispida*, *Thrincia hirta*, *Tragopogon pratensis* are common in meadows by the stream. *Salix pentandra*, a questionable native, is not infrequent, and a little farther very large moonwort, *Botrychum Lunaria*, nearly a foot in height, with *Lysimachia vulgaris*, were noted. On our first night we obtained beds at Mountrath. Below Mountrath *Œnanthe Phellandrium* sparingly, and the rare *Nasturtium sylvestre*, were the most interesting species. Bullfinches and goldfinches were not uncommon, and some timber by the river-banks rendered the scenery more pleasing. *Euonymus europæus* and *Origanum vulgare* occurred, while wild roses, especially *R. arvensis*, were abundantly in blossom. *Juncus glaucus* has been our constant companion; so also are *Polygonum amphibium* and *Scirpus lacustris*. Near Abbeyleix, I first noticed here a rather large sedge, *Carex vesicaria;* and in the Abbeyleix Woods *Campanula Trachelium* was obtained at the river's brink. Below Abbeyleix *Equisetum hyemale*, *Gymnadenia conopsea*, *Quercus sessiliflora*, and *Carex paludosa* occurred. Nearer to Durrow *Thalictrum flavum*, characteristic of the larger rivers in the inland counties of south-eastern Ireland, first appeared. At Durrow we passed a night. The accommodation in these little towns cannot be expected much of, but the people usually take pleasure in doing their best, which makes up for many shortcomings.

From Durrow we rejoined the Nore by the banks of a tributary, the Erkina. In it were seen the *Œnanthe* already mentioned, *Ranunculus Lingua*, *Sium angustifolium*, and *Carex vesicaria*. In thickets alongside of it, on the right bank near the junction, *Mercurialis perennis** was found in the greatest abundance for some distance. This is a very rare plant in Ireland, only occurring in about half a dozen localities, chiefly in the north, of which Parsonstown is the nearest. Along here occurred also *Campanula Trachelium* (sparingly), *Orchis morio*, *Euonymus europæus*, *Scutellaria galericulata*, *Lysimachia vulgaris*, *Gymnadenia conopsea*, *Nasturtium* (*Armoracia*) *amphibium*, and *Carex paludosa*. These were noticed in the order given along the right bank of the river to Ballyragget, where we have entered the County Kilkenny. The river is pretty, diversified with wooded banks. At Ballyragget *Matricaria Chamomilla* was found in a waste-heap by a mill-race; it is an alien, and appears very rarely. I have never gathered it in Ireland except once at Howth and once in Wicklow, both times in waste ground. *Malva moschata*, one of our prettiest wild flowers, was gathered. At Ballyragget we crossed to the left bank. About four miles down *Nasturtium sylvestre* again occurred. Yellow water-lily was frequent, the white hardly being met with. About two miles above Kilkenny, on the left bank, is a large patch of a naturalised Aster, which Mr. Baker believes is an American species, *A. lævis*. Its occurrence, with all the outward appearance of a native, for it is far from a garden at present existing, or pleasure ground, is very interesting, I found it again in still more unsuspicious circumstances, and farther from a road below Woodstock on the other side; and I have seen the same Aster since, apparently established, by a stream near Bundoran, in Donegal, and in a garden at Glengarriff, in Cork. In none of these places had it any sympton of a flower, up to the end of August at Bundoran. A little below the Aster, and from that to the town of Kilkenny, in wet meadows close to the river, *Colchicum autumnale* was met with abundantly, and now in fruit. The entrance to Kilkenny is very fine by the river, the Castle of the Ormondes being a most imposing structure. An excellent hotel afforded us a good night's rest.

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* I have recently received specimens of this plant from Glasslough, Co. Monaghan, where Miss Young finds it in abundance.

On the following morning (Tuesday, July 8th) we left Kilkenny. *Senebiera didyma* was noticed about the town. *C. sanguinea*, in the large shrubbery form, is naturalised below the town in several places. *Thalictrum flavum*, *Nasturtium palustre*, and *Verbena officinalis* occurred at Bennett's Bridge. The scenery has become wooded and beautiful. *Colchicum autumnale* still occurs. The two commoner *Sparganiums* (*S. minimum* and *S. ramosum*), *Origanum*, *Phalaris*, and *Rumex Hydrolapathum* were seen to Thomastown on the right bank. *Allium vineale* and *Lysimachia vulgaris* occurred freely at Mount Juliet, the seat of Lord Carrick. Near this, too, *Campanula Trachelium* was very plentiful in wet thickets near the river and at its very edge. Between Thomastown and Innistiogue I noted the *Campanula*, the large water-dock, *Centaurea Scabiosa*, *Ononis arvensis*, *Orchis pyramidalis*, *Scabiosa arvensis*, and *Epilobium hirsutum* as the species of most interest. At Innistiogue we stopped for the night in a most delightfully clean, well-supplied, and prettily-situated inn.

About Innistiogue, on old ivied walls, *Orobanche hederæ* is abundant. The great attraction to this little village is the beautiful demesne of Woodstock, at the gate of which it lies. The gardens of Woodstock are famous, and an hour or two were well spent in them under the guidance of a most intelligent Irish gardener. With especial pride he showed us a magnificent *Araucaria*, over fifty feet high. This, he stated, was the second best in the kingdom, the best being at Dropmore, which was planted a year earlier, the Woodstock one being planted in 1834. As a matter of fact the two oldest in the kingdom date from 1796, one at Kew and the other at Dropmore, the latter being, I believe, the best grown, and about sixty feet high. There is also here a double line of younger *Araucariæ* (1850), about 300 yards in length, with a grass lane between, under which circumstances they show to peculiar advantage.

In the woods above the river, on the right bank, *Carex pendula*, *Luzula pilosa*, and the wood onion, occurred. Blackcaps were singing in many cases; they are local birds in Ireland. I met them in a similar and almost as beautiful place by the Barrow, at Borris, the previous year.

From a little below Woodlands *Campanula Trachelium* becomes most abundant, all along the river amongst the coarsest weeds on dykes and embankments, and in tangled thickets at the water's edge to New Ross. I found it very sparingly the previous year near Portarlington, on the Barrow; the Nore, on which it has been long known, is its most satisfactory habitat in Ireland.

From Woodstock to New Ross, along the edge of the Nore on the right bank, is a kind of exploit in pedestrianism which demands some enthralling motive to make it go cheerfully. The river is tidal, and the osier banks and beds of reeds are often intersected by stagnant, sunken courses of slimy water on a bed of "glar."

Wide detours are sometimes imperative; but when one is tired it is astonishing how much filthy wading will be endured in preference to a wide detour. My friend, however, retired far inland. I found along here, in the order quoted, *Œnanthe Lachenalii*, *Scirpus maritimus* (first symptom of saline growth), *Carex pendula*, *Glyceria aquatica*, *Carex riparia*, *Aster* sp.? (*A. lævis*?), *Œnanthe fistulosa*, *Apium graveolens*, *Hordeum pratense* (a very rare grass), to Ballyneale. From Ballyneale onwards *Lycopus europæus*, *Dipsacus sylvestre*, *Orobanche hederæ* were met with, and *Glyceria*, *Campanula*, and *Carex riparia* occurred to below the junction of the Nore and the Barrow.

We arrived at New Ross in the afternoon of July 9th. On the following day we made use of the steamer to Waterford, and thence by rail to Cappoquin for the Blackwater. The Nore had been a decided disappointment compared with the Barrow. Both in scenery and botany the more western river exhibits a falling off. Bits of the Nore, as about Woodstock and Brown's Barn, are nearly as good as Graignenamanagh or St. Mullins, on the Barrow, but there is far more monotony along the Nore. The decrease in the rarer plants can easily be seen by referring to my paper on the Barrow in the 'Journal of Botany' for January, 1885.

On the 11th of July we steamed down the Blackwater Estuary from Cappoquin to Youghal. There is not a more lovely bit of scenery than this in the British Isles. If the Blackwater yields fewer rare plants than the other large Irish rivers, it can at any rate boast that it has no rival in beauty. From Youghal to Mallow is about seventy miles by the river, which we walked in three days, and the whole distance almost lay from one well-wooded gentleman's place to another. On the first day, Youghal to Cappoquin, the waters are tidal, and we also came in for floods, and had many difficulties to contend with. Hideous slimy channels, that could neither be swam, waded, nor jumped, often threw us far astray. In the salt-marshes near Youghal *Statice bahusiensis*, *Carex vulpina*, *C. extensa*, *Œnanthe Lachenalii*, *Apium*, and other commoner kinds occurred. *Equisetum maximum* may also be mentioned. *Carex paniculata*, *Scrophularia aquatica*, *Carex riparia*, *Lithospermum arvense*, were the most interesting plants along the left bank to Villierstown. Near Cappoquin *Elodea canadensis* has established itself.

On the following day (July 12) we kept the right bank up the river to Lismore. Near Cappoquin *Carex pendula* was found, and farther on *Nasturtium palustre* and *Lycopus europæus* appeared. At Lismore, or rather a little above the bridge, a fine clump of *Butomus umbellatus*, in full flower, was a most refreshing variety. *Rumex Hydrolapathum*, *Scrophularia aquatica*, and *Mentha rotundifolia* occurred here, the latter in two places, one below Lismore, and quite established. This mint is not (probably) native in Ireland. *Nasturtium palustre* is very abundant, and much larger than I have seen it elsewhere in Ireland along here. *Carex vesicaria*, *Scirpus sylvaticus*, *Lysimachia vulgaris*, *Lycopus*, *Epilobium hirsutum*, *Apargia hispida*, *Symphytum officinale*, *Pimpinella magna*, and *Saponaria officinalis* were gathered to Ballyduff. From Cappoquin the walking has been splendid, firm banks with a good hard sward, and just a reasonable amount of impediments. Near Fermoy *Butomus* occurred again, and with it *Nasturtium sylvestre*.

Since Ballyduff we have been in the County Cork. The Blackwater lies chiefly in this county, a small portion at the north-west end, where it rises, being in Kerry, while the last twenty miles of its course are in Waterford. Cork has received more special attention at the hands of botanists than any other Irish county, and I may here refer to the latest work on the subject by the Rev. Thos. Allin, whose flora renders it unnecessary for me to mention species which he has shown to be common in the county.

Having passed the night in a capital hotel in Fermoy we followed the left bank up the river to Mallow on the 13th. At Castle Hyde, a lovely place, I noticed *Epipactis latifolia*, *Arenaria trinervia*, and *Orobanche Hederæ*. At Ballyhooly I saw *Œnanthe Phellandrium*, the only place in the Blackwater it occurred. About a mile above Cregg Castle, on the left bank, I found a real rarity, *Allium Scorodoprasum*. I met with it again on the same bank at the lower part of Norreys Castle demesne near Mallow. It was growing in small grassy thickets near the stream in each locality, and had all the appearance of a native, not being on the brink, as species conveyed by the river usually are. The only other stations for this *Allium* in Ireland are Foaty Island, in Cork, and thickets at Killarney. Near Killawillin *Euphorbia hiberna* was first met with; it is found as far east, however, as Cappoquin.* *Geranium lucidum* and *Lithospermum arvense* were frequently seen. The decrease in the interesting river species as we travelled west was most noteworthy. Gradually they all disappeared, giving place to few species of any interest in their stead. About three miles above Mallow, which we left on the morning of the 14th, I met with *Nasturtium amphibium* in a drain leading to the river on the left bank. I will not positively commit myself to this locality, as I unfortunately did not secure a specimen; but being very familiar with the plant I can hardly have made a mistake. It is very rare in Cork, Mr. Allin being only able to supply two localities. *Euphorbia hiberna* and *Œnanthe crocata* are conspicuous plants to Mill Street, and with regard to the rest I have simply noted "all common."

From Mallow the Blackwater had neither botany nor beauty, so we bade it good-bye at Mill Street, and went westwards to Killarney, and thence over the Reeks to Sneem. In spongy bogs behind Sneem I found *Rhynchospora fusca* and *Carex limosa* in some profusion, and at Derryquin, near Sneem, *Lycopus europæus*, not a common plant in Kerry, occurs by the roadside.

From Kenmare we crossed by Cleonee and Inchiquin Lakes to Glengariff, back again from Kerry to the County Cork. About Cleonee *Botrychium Lunaria*, *Utricularia intermedia*, and *Eriocaulon septangulare* were gathered. At Inchiquin Lake a natural wood of some extent of holly, oak, alder, birch, hazel, crab-apple, and

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* [I found it still further east in 1880, a Colligan, near Dungarvan, Co. Waterford.—Ed. Journ. Bot.]

Viburnum occurs. The floor of it is literally paved with *Saxifraga hirsuta* and *S. umbrosa*. Irish spurge and the two filmy ferns are also common. This wood is called Uragh Wood. In it I found also *Carex pallescens* and *Neottia Nidus-avis*. The latter is very rare in Ireland, and has not been found in the South of Ireland below Wicklow previously. Near Glengariff *Scrophularia aquatica*, *Anthemis nobilis*, *Carex limosa*, *Radiola Millegrana*, and *Scutellaria galericulata* were found on the way to Berehaven. The *Scutellaria*, with the smaller one, *S. minor*, grows on the limestone shingle close by the edge of the sea in Bearhaven Bay, near Adrigoole, an unusual situation. On bare rocky mountains above Glen Lough, north-east from Adrigoole, I gathered *Sagina subulata* and *Juniperus nana*, both very rare in Cork. In one at least of the many lakes here *Eriocaulon septangulare* is abundant, an important addition to Mr. Allin's Flora.

In the foregoing herborization the following species are additions to the Flora of District 3 of 'Cybele Hibernica' and its Supplement:—

Nasturtium sylvestre.
Armoracia amphibia.
Œnanthe fistulosa.
Œ. Lachenalii.
Œ. Phellandrium.
Sium angustifolium.
*Matricaria Chamomilla.
Mercurialis perennis.
Rumex Hydrolapathum.
Sparganium minimum.
Carex pendula.
C. riparia.
Luzula pilosa.
Hordeum pratense.

Neottia Nidus-avis is an addition to the Flora of District 1, its locality being just inside the Kerry boundary, and *Eriocaulon septangulare* is an addition to the Flora of Cork; while new localities are given for several rare species, notably *Allium Scorodoprasum* and *Rhynchospora fusca*.

THE MOSS FLORA OF SUFFOLK.

By the Rev. E. N. Bloomfield, M.A.

On looking at the last edition of the 'London Catalogue of British Mosses and Hepatics,' it will be observed that the compilers knew little for certain of the Moss Flora of the Ouse Province, which comprises the counties of Norfolk, Suffolk, Cambridge, &c.

I think it may not be amiss, therefore, to bring together all the information I can procure as to the Flora of one of these counties, which may be taken as a fair specimen of the productions of the province.

I am fortunate in possessing very trustworthy materials for this enumeration in the case of the county of Suffolk. I have a good number of specimens from the late Mr. E. Skepper, of Bury St. Edmunds, Co-editor of the 'Flora of Suffolk.' These are supplemented by specimens gathered by the late Mr. F. K. Eagle, also of Bury, kindly communicated by Mrs. Skepper; and also some from the late Dr. White, of Lavenham. In addition to these, I have a good many specimens from the Rev. W. M. Hind, LL.D., of Honington, and also some from Mr. W. Jordan, of Cockfield, while I have gathered a few myself, both in East and West Suffolk. These specimens have been verified, and in not a few instances determined by Mr. H. Boswell, of Oxford.

By permission of Mrs. Skepper, the moss herbarium formed by Mr. E. Skepper was sent to the Rev. James Fergusson, of Fern Brechin, who has carefully examined it and favoured me with copious notes on the species contained in it.

Thus I am able to employ the nomenclature of the 'London Catalogue,' with the assurance that few errors are likely to have crept in, at any rate as regards the specimens examined.

The principal omissions will be the new critical species of such genera as *Sphagnum*, *Barbula*, *Bryum* &c., which have not been collected to any extent.

Mr. Skepper's and Dr. White's specimens were mostly collected about the years 1860—62. Mr. F. K. Eagle's, in the first half of the present century; only one or two packets having dates.

The western division of the county has been fairly well searched, and I have a pretty good set of specimens from it. The eastern division has only been examined, to any extent, near Yarmouth, in the beginning of the present century, by such good observers as Sir W. Hooker and Messrs. Dawson Turner, Dickson, &c.

In order to indicate the distribution, as far as I can at present, I have added E. = Eastern Division, W. = Western Division, but if neither of these marks are added it shows that specimens have been examined from both.

When we have seen no specimens the mark * is affixed. In all other cases I have had specimens myself, or there are some in Mr. Skepper's herbarium, or Mr. D. Turner's herbarium, *fide* Wilson in Bry. Brit.; but if in these exclusively Sk. Herb. or Turner Herb. is added to the locality. Where a species has not been met with in the vice-county since Mr. Eagle's time, but I have specimens collected by him, I have added (Eagle), but these are for the most part species easily overlooked.

The 'Natural History of Yarmouth,' which is quoted so often, is by Messrs. Paget (*i. e.*, Sir James Paget and his brother), and was published in the year 1834.

The parishes of Tuddenham and Wangford, mentioned in this list, are the parishes of those names in West Suffolk, both lying in the sand tract to the north-west of the county, sometimes called the Breck District.

Where no localities are given, the species is believed to be somewhat generally distributed, as indeed are many others for which localities are given here. The localities given are in most cases those only from which specimens have been examined.

Sphagnum acutifolium Ehrh. Tuddenham; Dunwich. — Var. *deflexum* Schpr. Tuddenham; Dunwich. — Var. *purpureum* Schpr.

Tuddenham (Sk. Herb.) W.—*S. fimbriatum* Wils. Somerleyton (Sk. Herb.). E.—*S. squarrosum* Pers. Somerleyton (Sk. Herb.). Redgrave.—*S. intermedium* Hoffm. Belton. E.—*S. rigidum* Schpr., var. *compactum* Brid. Tuddenham (Sk. Herb.). W. — *S. subsecundum* Nees, var. *contortum*. Dunwich. E. — Var. *obesum* Dunwich. E.— *S. papillosum* Lindb. var. *confertum*. Tuddenham (Sk. Herb.). W.— *S. cymbifolium* Ehrh. Tuddenham. Dunwich.

Gymnostomum microstomum Hedw. Tuddenham (Eagle). W.

Weissia viridula Brid. — *W. cirrhata* Hedw. Hengrave (Sir T. Gage); Henham; Little Glemham. W.* E.

Dicranella crispa Hedw. Herringfleet (D. Turner, 1810, Hist. Yar.). E.* — *D. cerviculata* Hedw. Gorleston, &c. (Hist. Yar.). Belton. E.—*D. varia* Hedw.—*D. heteromalla* Hedw.

Dicranum scoparium L. — *D. palustre* Brid. Tuddenham, &c.; Benacre.

Campylopus pyriformis Brid. Tuddenham; Tunstall, &c.

Leucobryum glaucum L.

Pleuridium subulatum L. W. E.* — *P. alternifolium*. Rare, Barton (Sk. Herb.). W.

Seligeria calcarea Dicks. Bury. W.

Sphærangium muticum Schreb. Risby (Eagle). W.

Phascum cuspidatum Schreb. Bradwell, &c. (Hist. Yar.); Bury. W. E.* — *P. bryoides* Dicks. Rare, Hardwick, &c. (Eagle); Great Glemham.

Pottia cavifolia Ehrh. Bury. W.—*P. minutula* Schwg. Bradwell (Hist. Yar.); Bury, &c. W. E.* — *P. truncata* L. — *P. intermedia* Turn. Lavenham; common (Hist. Yar.). W. E.* — *P. Heimii* Hedw. Wattisfield (Suffolk Fl.); Breydon Wall (Hist. Yar.); Felixstow. W.* E. — *P. lanceolata* Dicks.

Didymodon rubellus B. & S. Rare, Bury (Eagle); Bradwell (D. Turner, Hist. Yar.). W. E.*

Ditrichum flexicaule Schwg. Rare, Risby Heath (Sk. Herb.); Thetford Warren (Eagle). W.

Barbula aloides Koch. Bury, &c. (Sk. Herb.); Burgh Castle (Hist. Yar.); Great Glemham. — *B. lamellata* Lindb. Rare, Bury (Eagle). W. — *B. cuneifolia* Turn. Hopton (O. B. G.); Belton Common (Suffolk Fl.). E.* — *B. muralis* L. — *B. unguiculata* Dill. —*B. fallax* Hedw. Clay pits, common (Hist. Yar.); Bury, &c. W. E.* — *B. cylindrica* Tayl. Great Glemham. E. — *B. revoluta* Schwg. Bury (Eagle); Great Glemham. — *B. convoluta* Hedw. Rare, Thurston. W. — *B. subulata* L. — *B. lævipila* Brid. Lavenham; Great Glemham, &c. — *B. ruralis* L. Common on sandy ground. — *B. intermedia* Brid. Cockfield. W.

Ceratodon purpureus L.

Encalypta vulgaris Hedw. Bradwell and Burgh Castle walls (Hist. Yar.); Cockfield; Santon Downham. W. E.*

Grimmia apocarpa L. Bury (Sk. Herb.); Benhall. — *G. pulvinata* Dill.

Rhacomitrum canescens Hedw. Tuddenham; Tunstall, &c.

Zygodon viridissimus Dicks. Hardwick and Herringfleet (Sk. Herb.).

Ulota crispa Hedw. Felsham Wood (Sk. Herb.). Not uncommon (Hist. Yar.). W. E.* — *U. intermedia* Schpr. Framlingham (Eagle). E.—*U. phyllantha* Brid. West Stow. W.

Orthotrichum saxatile Brid. Stowlangloft; Icklingham (Sk. Herb.). W.—*O. affine* Schrad.—*O. diaphanum* Schrad.—*O. Lyellii* H. & T. — *O. leiocarpum* B. & S. Rare. Not uncommon (Hist. Yar.); Lavenham; Rendham.

Splachnum ampullaceum L. Belton Bog (O. B. G.); Tuddenham (Eagle). W. E.*

Ephemerum serratum Schreb. Bury (Suff. Fl.); Bradwell (O. B. G.). W.* E.*

Physcomitrella patens Hedw. Wangford, Eagle. W.*

Physcomitrium pyriforme L.

Funaria fascicularis Dicks. Lavenham (Dr. W.); Belton Common (D. Turner, Hist. Yar.). W. E.* — *F. hygrometrica* L.

Amblyodon dealbatus Dicks. Suffolk, Eagle.

Bartramia pomiformis L. Rare. Woolpit; Brandon; Santon Downham (Sk.); Henham (Eagle).

Philonotis fontana L. Belton Bog (Hist. Yar.); Bungay (Suff. Fl.); Tuddenham, &c. W. E.* — *P. calcarea* B. & S. Tuddenham (Sk. Herb.). W.

Leptobryum pyriforme L. Wangford, Eagle. On pots in greenhouses at Hardwick and Great Glemham. W.*

Webera nutans Schreb. Santon Downham (Sk. Herb.); Belton Common and Ashby Warren (Hist. Yar.). W. E.*— *W. carnea* L. Bury; Cockfield; Belton.

Bryum pendulum Hornsch. Thetford Warren. W. — *B. inclinatum* Swartz. Felixstow. E.—*B. lacustre* Brid. Near Yarmouth (D. Turner). Gorleston; Belton, near bog (Hist. Yar.); Wangford (F. K. Eagle, 1804). W.* E.*—*B. intermedium* W. & M. Lavenham. W.—*B. bimum* Schreb. Lakenheath (Sk. Herb.); Lavenham. W. — *B. atropurpureum* W. & M. Bury (Sk. Herb.); Felixstow; Great Glemham. — *B. cæspiticium* L. — *B. argenteum* L. — *B. capillare* L. — *B. Donianum* Grev. Ixworth Thorpe. W. This was not in fruit, so it may be doubtful. — *B. pseudo-triquetrum* Hedw. Thetford Warren; Redgrave Fen; Cavenham Severals. W. — *B. pallens* Swartz. Tuddenham. W. — *B. roseum* Schreb. Rougham, and near Bungay (Suff. Fl.). W.* E.*

Cinclidium stygium Swartz. In a bog at Tuddenham. Abundantly in fruit, Nov. 1860, and Nov. 1862. W.

Mnium cuspidatum Hedw. Abundant (Hist. Yar.). Common, but rare in fruit (Sk. M.S.). W.* E.* — *M. affine* Bland., *cum fructu*, Fornham St. Martin (Sk. Herb.); Mildenhall, F. K. Eagle. W. — *M. undulatum* Hedw. *Cf.* Barton; Great Glemham, &c. — *M. rostratum* Schrad. Lavenham; Ixworth, *cf.*, Great Glemham. — *M. hornum* L. — *M. serratum* Schrad. Ixworth Thorpe. W. — *M. punctatum* Hedw. Rare, Belton Bog (Hist. Yar.); Nayland; Wiston. W. E.*—*M. subglobosum* B. & S. Very rare, Tuddenham (Sk. Herb.). W.

Aulacomnium androgynum L. Belton Bog, rare (Hist. Yar.). E.* —*A. palustre* L. — Var. *imbricatum*. Tuddenham (Sk. Herb.). W.

Atrichum undulatum L.

Pogonatum nanum Neck. Rougham, &c. (Suff. Fl.); Fritton, &c. (Hist. Yar.); Tuddenham. W. E.* -- *P. aloides* Hedw. — Var. *minus* Bry. Eur. (*Dicksoni*). Lound and Fritton (Hist. Yar.). E.*

Polytrichum formosum Hedw. Felsham Wood. W. -- *P. gracile* Menz. Cavenham Severals. W. -- *P. piliferum* Schreb. -- *P. juniperinum* Willd. -- *P. commune* L.

Fissidens bryoides Hedw. Felsham Wood. W. -- *F. incurvus* W. & M. Bury. W. -- *F. adiantoides* Hedw. Belton Bog (Mr. Palgrave, Hist. Yar.). W. E.* Tuddenham Bog. W. E.* — *F. taxifolius* L.

Fortinalis antipyretica L. Near Yarmouth (Hist. Yar.); Lavenham; *cf.*, Troston. W. E.* — Var. *gigantea* Schpr. Great Glemham. E.

Cryphæa heteromalla Hedw. Barton; Barton Mills (Suff. Fl.). W. I have a Suffolk specimen gathered by Mr. Eagle probably at one of these stations.

Leucodon sciuroides L.

Antitrichia curtipendula L. Rare, Lowestoft Denes; Herringfleet Decoy. E.

Neckera complanata L. *Cf.*, Benhall.

Homalia trichomanoides Schreb. Felsham Wood, &c.; Benhall.

Leskea polycarpa Ehrh. Westleton (Suff. Fl.). E.*

Anomodon viticulosus L. *Cf.*, Lavenham and Benhall.

Thuidium tamariscinum L. *Cf.*, Felsham Wood.—*T. abietinum* L. Bury, &c. W.

Thamnium alopecurum L. *Cf.*, Felsham Wood.

Climacium dendroides L. Common in North West; *cf.*, Tuddenham; Orford.

Isothecium myurum Poll. Lawshall; Belton.

Homalothecium sericeum L.

Campothecium lutescens Huds.

Brachythecium glareosum B. & S. Orford; Walton. E. — *B. albicans* Neck. Barton Mills; Fritton, &c. — *B. rivulare* B. & S. Barton; Santon Downham (Sk. Herb.). W. — *B. rutabulum* L. —*B. velutinum* L.

Eurhynchium myosuroides L. Bungay (Suff. Fl.). E.* — *E. striatum* Schreb. — *E. piliferum* Schreb. Hardwick; Great Glemham. — *E. Swartzii* Turn. Troston; Polstead, &c. W. — *E. prælongum* Dill.

Rhynchostegium tenellum Dicks. Burgh Castle (Hist. Yar.); Framlingham Castle (Suff. Fl.). E.—*R. confertum* Dicks. Honington; Swefling.—*R. murale* Hedw. Horringer Church; Lavenham (Sk. Herb.). Herringfleet Hall (O. B. G.). W.* E.* — *R. ruscifolium* Neck.

Plagiothecium latebricola Wils. Belton (Sk. MS.). Note. — This was, I believe, determined by Mr. Wilson. — *P. denticulatum* L. Great Glemham; Cavenham Severals, &c. — *P. undulatum* L. Rare, Lakenheath, Eagle. Felsham Wood. W.

Amblystegium serpens L. — *A. riparium* L. Fritton Decoy (Sk. Herb.). Fakenham, &c.

Hypnum aduncum Hedw. Barton Mere. W. — Var. *Kneiffii* Bry. Eur. Knettishall. W. — *H. exannulatum* Gümb. Tuddenham. W.—*H. Cossoni* Schpr. Tuddenham. W.—*H. fluitans* L. Tuddenham; Lowestoft, &c. — *H. uncinatum* Hedw. Wangford (Suff. Fl.); Belton (Hist. Yar.). W.* E.* — *H. filicinum* L. Belton (Hist. Yar.); Tuddenham; Honington. W. E.*—*H. commutatum* Hedw. Tuddenham; Redgrave. W. — *H. falcatum.* Gorleston (Turn. Herb.); Tuddenham. — *H. rugosum* Ehrh. Brandon; Icklingham; Mildenhall. W. — *H. cupressiforme* L. — Var. *tectorum* Schpr. Rougham (Sk. Herb.). W. — Var. *filiforme* Bry. Eur. Lavenham. W. — Var. *ericetorum* Bry. Eur. Tuddenham (Sk. Herb.); Lound Heath (Turn. Herb.). — *H. resupinatum* Wils. Lavenham. W. — *H. molluscum* Hedw. Near Bungay (Suff. Fl.); Redgrave, &c.; *cf.*, Tuddenham. W. E.* — *H. palustre* L. Barton Mills (Suff. Fl.); Belton Bog, very rare (Hist. Yar.). W.* E.* — *H. polygamum* B. & S. Tuddenham (Sk. Herb.). W. — *H. stellatum* Schreb. Tuddenham; Belton Bog (Hist. Yar.). W. E.* — *H. cordifolium* Hedw. *Cf.*, Santon Downham (Eagle, Sk. Herb.). W. — *H. giganteum* Schpr. Tuddenham; Coney Weston; Redgrave Fen. W. — *H. cuspidatum* L. *Cf.*, Woolpit. — *H. Schreberi* Ehrh. — *H. purum* L. *Cf.*, Hardwick. — *H. stramineum* Dicks. Belton Bog (Hist. Yar.). E.* — *H. scorpioides* L. Belton Bog, &c. (Hist. Yar.); Lakenheath; Tuddenham; Redgrave. W. E.*

Hylocomium splendens Dill. *Cf.*, Tuddenham.—*H. squarrosum* L. *cf.*, Tuddenham. — *H. triquetrum* L. *Cf.*, Felsham Wood.

NOTES ON THE FLORA OF CEYLON.

By Henry Trimen, M.B., F.L.S.

(Continued from p. 209).

Wrightia flavido-rosea Trim.—Branches cylindric, the young twigs finely pubescent; leaves lanceolate, tapering at both ends or slightly caudate-acuminate, sessile, entire, membranous, rather rough on both surfaces, with short hairs scattered on the veins; venation prominent and reticulated beneath; cymes 3-flowered, two or three together at the ends of the branches; pedicels long, much thickened upwards, pubescent; buds pointed; calyx-segments broadly oval-triangular, obtuse, thick and gibbous at base, membranous at edges; scales small, ovate, alternate with the segments; corolla with the short tube one-third longer than the calyx-segments; lobes oval-oblong, obtuse or subacute, puberulous on both sides, not fleshy, orange-salmon-coloured, becoming purplish grey when withering; coronal scales of the same colour, 10 strap-shaped, cut one-third down into 3 filamentous segments and 10 undivided linear; anthers with a tuft of white hairs at summit, pubescent externally, dirty white; style thickened upward; stigma with two short papillæ on summit; fruit not seen.

Hab. Near the foot of Doluwe Kande, north of Kurunegala, N. W. Province, May, 1884.

A small tree with very tough and fibrous inner bark. Branchlets thickened at the nodes. Leaves 4–6 in. long, deep apple-green, paler beneath. Flowers large, $1\frac{1}{2}$ in. across, the tube of corolla $\frac{1}{8}$ in. Coronal scales a darker colour than the corolla-lobes, and arranged thus:—The 5 outermost trifid ones opposite the corolla-lobes and adherent to them for their lower one-third, the 5 inner trifid ones alternate with these and immediately outside the stamens; the 10 undivided ones in pairs between the bases of the stamens.* The flowers, when quite dry, become dull bluish grey; both they and the leaves, when fresh, are full of a milky juice.

This is no doubt the plant doubtfully referred to by Thwaites (Enum. p. 193) as *W. Rothii*, var. *puberula*. The specimen (C. P. 1837) is from Dambulla, collected by Gardner. In the 'Fl. Brit. Ind.' (iii., p. 653) *W. Rothii* G. Don is placed as a variety under *W. tinctoria*, but neither is given for Ceylon. Our plant does not well agree with Roth's description (Nov. Pl. Sp., p. 121), but it ought perhaps to form no more than a subspecies of *W. tinctoria*. From the ordinary forms of that species (which is met with in Ceylon in cultivation only) it differs remarkably in the colour of the flowers (which are always white in *W. tinctoria*), and in the more slender habit, form of the leaves, &c.

The change of colour undergone by the flower before withering is analogous to that of *W. tomentosa*. In that species the corolla (which is thick, fleshy and brittle, and has an unpleasant scent) is at first pale dull greenish-ochre (quite green externally), the corona alone being salmon-coloured, but soon the whole changes into a dull inky-purple. Hence the discrepancies in descriptions as to colour alluded to in 'Fl. Brit. India.' In this species the coronal scales are coherent, forming a fleshy, truncate, somewhat 5-lobed, short tube or ring.

Tylophora flava Trim. — Absolutely glabrous in all parts; leaves ovate or oblong-ovate, cordate at base, rounded and suddenly acuminate at apex, thick and fleshy, rather glaucous, yellowish green, with paler conspicuous veins; petiole very short, without glands; peduncles very short, usually dichotomous; flowers on slender pedicels, crowded on the contracted branches so as to be sub-umbellate in axils of very small acicular bracts; calyx-segments long, lanceolate, quite glabrous or occasionally with a few bristly hairs; corolla-lobes ovate-oblong, subacute, pale greenish yellow, the throat stained with purple; coronal processes adnate to the gynostegium at the base, and there broad and fleshy, tapering above into thick triangular incurved points reaching the stigmatic table; fruit-carpels spreading in a line, each about $3\frac{1}{4}$ in. long, linear, tapering to a blunt point, cylindrical, smooth.

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* In *Wrightia zeylanica* there is a further (4th) row of these bodies, consisting of five more pairs of erect undivided filaments, just outside and opposite to the stamens. In *W. angustifolia* Thw. there is but one row of five trifid and laciniate bodies alternate with the petals.

Hab. Abundant on the sandy coast southward from Colombo with other sea-shore plants, and conspicuous from the bright colour of its foliage. Leaves often nearly 5 in. long, more or less bullate; petioles not ½ in. long. Pedicels about ½ in., soon disarticulating at the bract-axil. Flowers ⅝ in. diam.

This I should have regarded as a maritime variety of *T. asthmatica*, but for the different form of the coronal processes. These in that species are very abruptly narrowed into a short filiform point, instead of gradually tapering off, as in *T. flava*. The other points of difference are the complete glabrosity, shorter peduncles and pedicels, larger flowers of a different colour, and narrow follicles. Thwaites' var. *glabra* of *T. asthmatica* (C. P. 1849) may be this plant in part, but the specimens here are insufficient to decide. Hooker (Fl. Brit. Ind., iv., p. 40) refers it to *T. pauciflora* W. & A., but with some doubt.

Christisonia (OLIGOPHOLIS) **Thwaitesii** Trim. — *C. unicolor* Thw. Enum. Pl. Zeyl. p. 222, pro max. part., ? Gardner.—*C. neilgherrica* Hk. f. Fl. Brit. Ind. iv. p. 322, pro parte, non Gardn.—Flowering-stem short and stout, bearing 3–8 large flowers on rather long thick pedicels from axils of obtuse or rounded scales, not crowded; pedicels naked, with no bracts beneath the flowers; calyx over 1 in. long, glabrous, completely closed in the bud and produced into a point, so that the bud is beaked, semispathaceous, deeply 2-cleft, the lips usually more or less deeply cut into 2 and 3 teeth; corolla large, infundibuliform, curved, glabrous externally, uniform pale yellow; stamens scarcely exserted; filaments glabrous; both pairs of anthers coherent, the upper with short, the lower with very long spurs projecting forward; style a little longer than stamens and more exserted; stigma large, broad, crescent-shaped or reniform; placentas large, fleshy, meeting in the centre, and ovaliferous throughout, except where in contact.

Hab. Palagalla, Oct. 1853. (C. P. 2971 in Herb. Perad.).

"Whole plant of a bright pale yellow colour, the flowers paler," quite glabrous, the rhizome short and stout. Flowers 1½–2 in. long, the corolla decidedly 2-lipped. I have not seen this living; it is described from good herbarium-specimens and an excellent coloured drawing. Thwaites' short description of *C. unicolor* (*loc. cit.*) was clearly principally made from this plant, but the old coloured drawing, which was the *whole* foundation of Gardner's species, seems to have been also used. This old figure is very unsatisfactory, but, as it shows two bracts beneath each flower, it is apparently a different species, and may be perhaps rightly placed under *C. neilgherrica*, as done by Sir J. Hooker; the flowers are small, and the calyx nearly truncate. But as no specimens corresponding with this figure exist,* *C. unicolor* Gardn. must ever remain indeterminable.

C. neilgherrica is rightly made synonymous with *Campbellia*

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* C. P. 1780, quoted doubtfully by Thwaites for *C. unicolor*, is represented here by a single flower, not named, but collected by Gardner. It is probably *C. bicolor*.

cytinoides Wight in the 'Fl. Brit. India,' but this is very distinct from the plant above described. It is not infrequent in the high mountainous forests here, growing on the roots of *Strobilanthes*, and I have had several opportunities of examining fresh specimens. I am inclined to think Wight's genus a good one, and its reunion with *Christisonia* by Sir J. Hooker to be uncalled for. The structure of the anthers is very different in *Campbellia;* they are strictly one-celled, open by a terminal pore, and are quite free from one another and without spores; the style, too, is different, being hooked, ovoid, and quite entire. The genera are, however, closely allied, and their station away from one another in different natural orders, as in the 'Gen. Plant.,'* is as clearly an extreme in the opposite direction. The structure of the ovary and placentas is quite the same in both genera, truly one-celled in all I have examined, except occasionally near the base.

C. Thwaitesii, from its ebracteolate pedicels and large fleshy placentas, is referable to Wight's genus *Oligopholis*, which is generally regarded as not distinct from *Christisonia;* but this also requires further examination of fresh specimens, which I hope I may get the opportunity of making.

Christisonia bicolor Gardn., var. *spectabilis.* — *C. spectabilis* Thw. ms. — Differs from var. *pallidiflora* Thw. (*C. pallida* Gardn.) in its much larger size, the flowers reaching 3 in. in length, with a more spreading limb, which is pure white, the tube being yellow and the calyx pink; the rhizome is much stouter.

Hab. The Knuckles Hill, Kallebokka Valley, Central Prov., Sept. 1868. (C. P. 3983 in Herb. Perad.). A very beautiful variety of this variable species, connected with the type through forms of *pallidiflora.*

Scutellaria spicata Trim.—Stem stout, erect, densely covered with short deflexed hairs; leaves ovate or ovate-oblong, on hairy petioles, cordate or subcordate at base, obtuse at apex, strongly crenate, nearly glabrous above, densely velvety-hairy on the prominent veins beneath; flowers few, very shortly stalked or subsessile, forming a terminal erect unbranched spicate inflorescence 3–4 in. long; bracts broadly oval, longer than the pedicel, all densely hairy, with spreading hairs; calyx longer than in other Ceylon species, strongly pilose; corolla very large, the tube wide, hairy without, the segments very wide.

Hab. By streams on Adam's Peak, at about 5500 ft. elevation, March, 1883. This may perhaps be no more than a variety of the common and variable *S. violacea;* but the very large wide-tubed coralla (over ½ in. in length), large bracts and nearly sessile flowers give it a very distinct look, and may be sufficient for specific separation. I have not seen a specimen of *S. robusta* Benth. (DC. Prod. xii. p. 418), also from Ceylon, which, from the description, must come very near; and is placed by Thwaites (Enum. p. 232) under *S. violacea.*

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* *Christisonia albida* Thw., referred to *Campbellia* in 'Gen. Plant.' ii. p. 967, is rightly put back again into *Christisonia* in the 'Fl. Brit. India.'

Phyllanthus (Reidia) **Uakgalensis** Thw. ms. (Epistylis). — Leaves small, crowded, oblong-linear, very shortly stalked, tapering at base, acute at apex, not oblique, copiously dotted; midrib prominent beneath; stipules subfalcate, very acute, persistent; flowers few, mostly in the upper axils; peduncles filiform, nearly as long as leaves; male perianth with 4 broadly oval, rounded, very obtuse, glabrous, entire segments; female perianth with 6 similar segments twice the size of the male; capsule quite smooth.

Hab. None given with the specimens, but presumably Uakgala Hill, Central Prov. (C. P. 4015 in Herb. Perad.). A small shrub with many slender twiggy branches. Leaves less than $\frac{1}{2}$ in. long. Male perianth $\frac{1}{8}$ in., female $\frac{1}{4}$ in. in length.

Differs from its nearest Ceylon allies, *P. affinis*, *P. cinereus*, &c., in its very broad entire perianth-segments, glabrous capsule, and narrow leaves, which are not at all oblique. I have not seen it in a living state, and the herbarium material is but scanty.

Ficus Trimeni King ms. — *Urostigma Tjiela* Thw. Enum. p. 265, in part (non Miq.).—"A gigantic tree with few aërial roots, all parts glabrous; leaves coriaceous, oval or elliptic, with a short blunt apiculus, entire edges, and a slightly tapering obscurely 3-nerved base, 3 to 4·5 in. long; midrib thick and prominent; lateral nerves diverging from the midrib at a low angle, slightly prominent when dry, numerous, close, straight, anastomosing just within the thickened slightly revolute margin; petioles about ·75 in. long; stipules ovate-acuminate, ·4–·6 in. long. Receptacles sessile in pairs, axillary, globular, slightly verrucose when ripe, ·4–·5 in. across, with three small spreading ovate-cordate slightly pubescent basal bracts."

Hab. Not uncommon in the Central Province, especially in the lower hills, at an elevation of 1000–2000 ft., as Peradeniya, Kaduganawa, &c. (C. P. 2220 in Herb. Perad.).

"This species approaches *F. Tsiela* Roxb., and *F. retusa* L., var. *nitida*, but differs from both by its more numerous straight primary nerves, much more spreading habit, and fewer aërial roots" (King ms.). It is not confined to Ceylon, having been collected in the Indian Peninsula by Law—in Canara, Dhurwar, and Bellary Districts.

I am much indebted to Dr. King, of the Calcutta Botanic Gardens, for sending me the above description, which will appear in his forthcoming monograph of the Indian *Ficus*. I had determined the tree as *F. indica* L. Syst., and it is given under that name in my "Hand-Guide" to the Peradeniya Botanic Gardens of 1883 (p. 23). A gigantic tree here is a well-known and prominent object, and is referred to by Thwaites in a note under *U. Tjiela* in his 'Enum.,' p. 265.* This tree commenced life parasitically on a Jack-tree, which it strangled and superseded; it is now a magnificent specimen, with symmetrically spreading unsupported branches covering a circle of ground over 200 ft. in diameter. The orange-red fruit, the size of a small cherry, is ripe in July and August.

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* A photograph of the trunk of this tree was taken in 1879, and there is, if I remember rightly, a copy of it in the Timber Museum at Kew Gardens. It is of further interest as containing a portrait of the late Dr. Thwaites seated beneath the branches of the tree.

Ficus caudiculata Trim. — Leaves oblong-oval, 3–4 in. long by 1½–2 in. wide, rounded at the base, suddenly narrowed into a slender acute tail at the apex ⅝–½ in. long, and often twisted; midrib very strong, wide, and prominent beneath; lateral veins well-marked, nearly straight, diverging at a wide angle, anastomosing by arches just within the margin, the intervening spaces evenly filled in with elegant rectangular reticulations raised beneath; texture rather thick, glabrous, dark green above, pale beneath; petiole ¾ in. or more, channelled above; stipules larger, an inch long, tapering into long, very acute points, membranous, orange-red, rather persistent; receptacles sessile, solitary?, smooth, red, as large as a sloe, with 2 or 3 large fused flat bracts at the base.

Hab. Paregodde, Pasdun Korle, Western Prov., June, 1883.

A few specimens only of this were brought in by the Garden collectors, and I have not yet succeeded in obtaining more; but Dr. King, to whom I have submitted one of them, agrees that they represent a distinct species hitherto undescribed. The collectors described it as a large tree. The twigs are stout, with a yellow-grey bark, strongly marked with the scars of the fallen leaves and stipules.

ELATOSTEMA LINEOLATUM Wight, var. PETIOLARE Thw. ms. — Leaves 4–5 in. long, including the petiole of ½–¾ in., into which the blade tapers gradually, narrowly lanceolate, caudate, with a long linear or strap-shaped tail, with 2–4 very coarse and large teeth on either side in upper part, entire below; cystoliths linear, only showing on the under surface and on midrib and margins above, dark green, very pale beneath.

Hab. Central Province, May, 1866. (C. P. 3920 in Herb. Perad.).

A remarkable form of an extremely variable species, or perhaps of specific distinctness. The leaves are as large as in var. *majus* Wedd., and, besides the presence of a petiole, are remarkable for the absence of cystoliths on their upper surface, which becomes dark brown after drying.

Dendrobium albidulum Thw. ms. — Small, cæspitose; pseudo-bulbs about ½ in. long, oblong-ovoid, pale green when young, afterwards yellow and wrinkled; leaves about 4, the sheaths wide, membranous, and striate; blade ¾–1¼ in. long, linear-lanceolate or oblong-lanceolate, acute or subacute, somewhat twisted, bright apple-green; midrib prominent beneath; racemes terminal, usually solitary, rarely 2, with 1–5 small flowers on slender pedicels twice or thrice as long as the subtending acuminate bracts; sepals and petals oblong-lanceolate, acute, nearly equal, the petals a little narrower, spreading, all pure white; labellum rhomboidal, attenuated at base, 3-lobed, the lateral lobes short acute, the central one rounded, subacute, with the margin crenate and crisped, all pale green finely dotted with claret-colour, the centre of the basal half occupied by a two-grooved ridge ending in

3 small projecting teeth; spur short, blunt, flattened, slightly curved; column short, prolonged below, winged, white with claret dots; capsule broadly or roundish-ovoid.

Hab. Common on tree-trunks in the higher hill-forests, as about Kakgala, whence the specimens named by Thwaites were collected, Oct. 1866. (C. P. 3926 in Hb. Perad.*).

A small but rather pretty little species, the flowers about ½ in. across, slightly nodding. It appears to be near *D. microbolbon* A. Rich. (*D. humile* Wight Ic. t. 1643), which has, however, larger and more numerous flowers of a different colour, and with a sharp spur.

Bulbophyllum crassifolium Thw. ms. — Small; pseudobulbs small, numerous, about the size of a pea, nearly spherical, smooth; leaves solitary, ½–¾ in. long, sessile, very fleshy, oval, obtuse, the midrib marked by a furrow above; flowers solitary, each on a very short peduncle in the sheath of a short truncate bract; sepals nearly equal, broadly ovate, the upper one erect, arched, the lateral ones spreading, yellowish green, densely and minutely punctate with red; petals minute, broad, truncate; labellum very small, tongue-shaped, obtuse, white.

Hab. On the trunk of a tree, Kukul Korle, Western Prov., Sept. 1865. (C. P. 3879 in Herb. Perad.).

A very small and inconspicuous species, of which I have only seen the herbarium specimens above described. Belongs apparently to the *elegans* section, but remarkable for its very small solitary flowers. The leaves are dark green, and very like those of some *Hoya*. The above description is principally taken from a MS. note of Dr. Thwaites.

Cleisostoma Thwaitesianum Trim. — *C. maculosa* Thw. Enum. p. 304, non Lindl.—An *C. decipiens* Lindl. ?—Leaves large, 8–10 in. long by 1 in. or more wide, distichous on the short stem, obliquely emarginate at apex, thick, flat, dotted with minute purple spots beneath, especially near the base; inflorescence 2–6 in. long, unbranched or with a few slender curved ascending branches; flowers small, numerous, sessile; sepals and petals nearly alike, half-spreading, oval or oval-oblong, subacute, lemon-yellow, with large vinous-red stains; labellum small, broader than long, entire, paler yellow; spur short, broad, blunt, gibbous; capsule about ½ in. long, linear oblong, ribbed; seeds golden-yellow.

Hab. Not an uncommon orchid on trees in the moist low country. The specimens described were collected at Heneratgoda, Western Prov., in February of the present year (1885). (C. P. 3193 in Herb. Perad.).

Mr. Bentham, in Gen. Plant. iii. p. 581, has pointed out that this plant is not the *C. maculosum* of Lindley (to which he refers the Ceylon plant called by Thwaites *Saccolabium lineolatum*), but seems to be a new species near *C. Wendlandorum* Rchb. f.† Bentham states that he had not seen specimens, but only a drawing; this, however, if as I suppose a copy of the one in the Herbarium here, is a very accurate representation of the plant. I have had, therefore, to re-name the species; which I do with some hesitation, as it seems not improbable that *C. decipiens* Lindl. in Bot. Mag. 1844, Misc. p. 11, may be the same. This species is from Ceylon; but the description is brief, and in the form and colour of the sepals and petals, and some other points, does not quite agree with that above given.

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* Specimens are also to be found under C. P. 2353 mixed with those of *D. panduratum* Lindl., which it a good deal resembles.

† I have not seen the description of this species.

Disperis zeylanica Trim.—*D. tripetaloidea* Lindl. in part (non *Dryopeia tripetaloides* Thouars); Thw. Enum. p. 311.—Flowers with the lateral sepals connate for their lower half; labellum deeply bifid, with long linear divaricate lobes.

It is noted by Mr. S. Moore, in Fl. Mauritius, p. 331, that the Ceylon plant is evidently different from the Mascarene *D. tripetaloides*, and indeed the above characters abundantly distinguish it.

This singular little plant is found amongst decaying leaves and rocks in the forests of the lower hills, now, however, mostly cleared. It flowers in April and May, which is the period at which the majority of our orchids blossom. I also met with it in the Nilgiris, South India, below Coonoor, in 1883; where there is also a second species of this curious chiefly African genus.

Curcuma oligantha Trim. — Small; tubers oblong-ovoid or fusiform; leaves petiolate, the petioles dilated into long sheaths below; blade oval, acute at both ends, much undulated, glabrous, thin, with distinct veins and transverse veinlets; flowering-scape appearing with the new leaf-shoot and given off from the axil of one of its basal scales, short and slender, with two or three blunt brown scales, terminated by the very reduced spike of 4–6 erect acuminate bracts, all of which are floriferous; flowers very few, large, erect, as long as the spike, white; corolla-tube 1 in. long, slender, white; segments long, acuminate-obtuse, pinkish, the posterior rather longer and more acute, petaloid; staminodes subacute, crisped, pure white; labellum large and broad, rather deeply bifid, white, with lemon-yellow stains in the throat; anther short; basal spurs rather long, curved; seeds without an aril, oblong, grey, shining.

Hab. Uma-oya, near the Maha-weli River, north-west of Badulla, Cent. Province, Oct. 1884. A small plant for this genus. Tubers 1–1½ in. long. Leaf-blades 5–7 in. long, the texture remarkably thin, of a bright light transparent green. The flowering-scape and young tuft of leaves are on one and the same new axis, which is given off laterally from the old root-stock. Bracts about 1 in. long, pale green. A single flower only is open at once in each spike, and as it stands up much above the bracts the scape appears at first sight to be one-flowered.

This species is allied to *C. albiflora* Thw., figured well in Bot. Mag. t. 5909, and, like that, has no terminal tuft of empty bracts, as in the rest of the genus. The texture of the leaves in *C. oligantha* is very unlike that of all other species of *Curcuma*.

I have no doubt that the fragmentary specimens (C. P. 3700) from Anaradhapura mentioned by Thwaites (Enum. p. 316) are to be referred to this species.

(To be continued.)

NORTHAMPTONSHIRE MOSSES.

By H. N. Dixon, M.A., F.L.S.

I am able to record the following additions to the Northamptonshire Moss-flora, made since last year (see Journ. Bot. 1884, 235–237). B. = barren; f. = in fruit. New species recorded:—

Systegium crispum Hedw. Kingsthorpe.

Weissia cirrhata Hedw. Harleston Firs; Rush Mills.

Campylopus flexuosus Brid. Harleston Firs (b.).

Pottia intermedia Turn. Kingsthorpe; Yardley Chase (R. Rogers). — *P. lanceolata* Dicks. Kingsthorpe; Newnham, &c.

Didymodon sinuosus Wils. Rush Mills (b.).

Ditrichum flexicaule Schwg. Wittering (b.).

Trichostomum tophaceum Brid. Wansford, limestone-quarries.

Barbula aloides Koch. Kingsthorpe; Wansford; Castle Ashby, &c. (R. Rogers).—*B. lamellata* Lindb. Kingsthorpe.—*B. rigidula* Dicks. Frequent (b.).—*B. Hornschuchiana* Schultz. Newnham (b.).

Ceratodon conicus Lindb. Duston (f.); Kingsthorpe, in fine fruit, 1885.

Ulota crispa Hedw. Salcey Forest; Ashton.

Orthotrichum obtusifolium Schrad. Ash tree, Kettering, April, 1885 (b.).—*O. pumilum* Swartz. Same tree as the last, Kettering, April, 1885.—*O. tenellum* Bruch. Great Houghton; Wittering, &c. —*O. leiocarpum* B. & S. Salcey Forest, &c.

Webera annotina Hedw. Kingsthorpe; Harleston; all barren.

Bryum bimum Schreb. Frequent in bogs. — *B. murale* Wils. Harleston. — *B. roseum* Schreb. Northampton (b.).

Mnium affine Bland. Harleston Firs (b.); Castlethorpe (b.).

Catharinea Dixoni Braithw. ms. Northampton, April 3rd, 1884 (b.); (see Journ. Bot. 1885, p. 169).

Neckera pumila Hedw. Salcey Forest (b.).

Homalia trichomanoides Schreb. Frequent.

Thuidium abietinum L. Wittering (b.).

Camptothecium lutescens Huds. Wittering; King's Cliffe; both barren.

Scleropodium cæspitosum Wils. Kingsthorpe (b.).

Brachythecium albicans Neck. Harleston Heath, abundant (b.).

Eurhynchium Teesdalii Sm. Kingsthorpe, Nov., 1884.

Hypnum revolvens Swartz. Wittering Marsh. — *H. commutatum* Hedw. Wittering, abundant in bogs.—*H. palustre* L. Kingsthorpe.

New varieties:—

Barbula muralis var. *æstiva* Brid. Althorp. — *B. fallax* var. *brevifolia* Wils. Duston (b.).

Atrichum undulatum var. *abbreviatum* (Bry. Brit.). Broughton.

Polytrichum commune var. *perigoniale* Schpr. Kingsthorpe.

Amblystegium serpens var. *majus* Brid. Near Castlethorpe.

The following have been found in fruit:—

Barbula recurvifolia Schpr. In fine fruit at Floore House, 1884. —*B. latifolia* B. & S. Fruiting on several trees in the Nene Valley. Harleston; Kingsthorpe; Castlethorpe.

Ceratodon conicus Lindb. Kingsthorpe.

Zygodon viridissimus Dicks. Abundant fruit at Daventry, March, 1885. Sparingly at Sywell and Great Houghton, 1885.

Orthotrichum Lyellii H. & T. Fruiting at Nobottle and Salcey Forest; Castle Ashby (R. Rogers).

Mnium undulatum Hedw. Nobottle.

A NEW CHINESE *POGONIA*.

By H. F. Hance, Ph.D., F.L.S.

Pogonia (Nervilia) **Fordii.**—Tubere rotundo v. oblongo albo, folio unico hysterantho cordato-ovato acuminato margine undulato sinu basali lato aperto concolori læte viridi sparsim pilosulo 20-nervio nervis 10 alternis inconspicuis immersis reliquis magis conspicuis in pagina superiore laminula v. crista parva elevata e seriebus pluribus cellularum diaphanarum conflatis per totam longitudinem instructis $2\frac{1}{2}$ poll. longo basi $2\frac{3}{4}$ poll. lato petiolo $3\frac{1}{2}$ pollicari suffulto, scapo 7–8 pollicari glaberrimo 4-floro squama unica prædito, bracteis lineari-setaceis reflexis, floribus pedunculatis nutantibus 10 lin. longis, perigonii subclausi segmentis fere inter se æqualibus viridulis purpureo-striatis labello albido striis purpureis divergentibus picto intus apice et secus medium dense albo-villoso trilobo lobis lateralibus erectis acutis intermedio oblongo apice rotundato brevioribus, columna basin lobi intermedii fere attingente.

In montibus Lo fau shan, prov. Cantonensis, a cl. C. Ford effossæ plantæ m. Maio 1885 in horto bot. Hongkongensi floruerunt. E stirpe viva erui characteres. (Herb. prop. no. 22301).

P. flabelliformis Lindl. is doubtless the nearest ally of Mr. Ford's *trouvaille*, which however differs, as shown by Blume's beautiful figure and analyses,* by the shape and extreme villosity of the middle lobe of the labellum, by the form of the leaves, and especially by the very remarkable raised plate over the alternate nerves, equally noticeable in the living and dry plant, nothing approaching which can I anywhere find recorded.

I am not aware that any species of *Pogonia* has hitherto been recorded from China, but I have a lovely species (§ *Eupogonia*(gathered in May 1881 on wet rocks near Wu hu, in the province of An hwei, at an altitude of 3000 feet, by Mr. Bullock, with bright scarlet flowers (according to the collector) an inch and more in length, and a fimbriate labellum. Furthermore, the Rev. B. C. Henry collected on the Lo fau shan range, in May 1883, at an elevation of 2500 feet and upwards, a plant which I am inclined to refer to *P. ophioglossoides* Nutt. (already known from Japan), though the blossoms are conspicuously smaller.

I may take the opportunity of stating that Mr. Ford has quite recently found very sparingly, on Mount Parker, Hongkong, a *Vrydagzynea*, which does not appear to differ from the Javanese *V. nuda* Bl.

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* Fl. Javæ iv. t. 56.

A SYNOPSIS OF THE GENUS *SELAGINELLA*.

By J. G. Baker, F.R.S., &c.

(Continued from p. 180.)

278. S. pumilio Spring Mon. ii. 241.—*Lycopodium pumilio* R. Br. —Stems very slender, erect, nearly simple, under an inch long, with root-fibres confined to the base. Leaves of the lower plane spaced, ovate, acute, denticulate, ½ lin. long, membranous, nearly equal-sided; leaves of the upper plane one-third as long, ovate, acute. Spikes very short, resupinate; bracts dimorphous, those of the upper plane ovate, acute, erecto-patent; of the lower plane ovate-cuspidate, ascending.

Hab. Endeavour River, Australia, *Sir J. Banks*!

279. S. minutifolia Spring Mon. ii. 239.—Stems densely tufted, very slender, erect, pale straw-coloured, 2–3 in. long, copiously pinnate, the branches erecto-patent, the lower slightly compound. Leaves of the lower plane very distant, erecto-patent, ovate, acute, ¼ iln. long, membranous, serrulate, broadly rounded on the upper side at the base, and imbricated over the stem; leaves of the upper plane also spaced, one-third as long, ovate, acute. Spikes copious, very small, under a line in diameter, resupinate; bracts of the upper plane oblong-lanceolate, bright green, erecto-patent, crowded rather squarrose; of the lower plane ascending, ovate-cuspidate, pale.

Hab. Woods of Tenasserim, at Mergui and Moulmein, *Griffith*! *Helfer*! *Boulger*! One of the smallest species of the genus.

280. S. Zollingeriana Spring in Pl. Junghuhn, 278. — Stems very slender, erect, 1–1½ in. long, pinnate, the branches erecto-patent, the lower slightly compound. Leaves of the lower plane very distant, lanceolate, acute, ½ lin. long, pale green, membranous, nearly equal-sided, minutely denticulate; leaves of the upper plane one-third smaller, ovate-lanceolate. Spikes resupinate, ⅙–⅓ in. long; bracts of the upper plane erecto-patent, ovate-lanceolate, unequal-sided; of the lower plane one-third shorter, more ascending, ovate-cuspidate.

Hab. Java, *Zollinger* 2226! Celebes, *Zollinger* 3313!

281. **S. Hornei**, n. sp. — Stems about an inch long, very slender, erect, 2–3 times dichotomously forked. Leaves of the lower plane spaced, rather ascending, oblique oblong, obtuse, nearly a line long, bright green, membranous, nearly equal-sided, broadly rounded, shortly ciliated, and slightly imbricated over the stem on the upper side at the base; leaves of the upper plane one-third as long, ovate, acute. Spikes very short, resupinate, 1 lin. diam.; bracts of the upper plane ovate-lanceolate, erecto-patent; of the lower plane shorter, ovate, acute, ascending, pale.

Hab. Fiji Islands, *Horne*!

282. S. nana Sprlng Mon. ii. 240. — Stems very slender, erect from a creeping base, 2 in. long, the upper branches simple and erecto-patent, the lower spreading and slightly compound, Leaves of the lower plane rigid in texture, subcontiguous, ovate-oblong,

subobtuse, a line long, nearly equal-sided, ciliated at the base on the upper side; leaves of the upper plane one-half to one-third as long, ovate, apiculate. Spikes short, resupinate; bracts of the upper plane ovate-lanceolate, acute; of the lower plane ascending, broad ovate, cuspidate.

Hab. Port Praslin, New Ireland, *Commerson*!

283. **S. Kurzii**, n. sp. — Stems suberect, 3–4 in. long, pale straw-coloured, stronger than in *S. chrysorhizos*, copiously pinnate, the short erecto-patent branches copiously compound. Leaves of the lower plane contiguous on the branchlets, rather spaced on the main stem, all erecto-patent, ovate-lanceolate, acute, pale green, membranous, rather more produced on the upper side of the midrib, broadly rounded, shortly ciliated, and much imbricated over the stem on the upper side at the base; leaves of the upper plane half as long, ovate, with a large cusp. Spikes copious, short, resupinate, 1 lin. diam.; bracts very dimorphous, those of the upper plane ovate-lanceolate, erecto-patent; of the lower plane ovate, acute, ascending, strongly keeled.

Hab. Forests of Pegu, *Kurz* 3187! Midway between *glauca* and *alutacea*.

284. S. MINIATOSPORA Baker. — *Lycopodium miniatosporum* Dalzell in Hook. Kew Journ. iv. 114. — Stems very slender, erect, 3–4 in. long, copiously pinnate, the branches erecto-patent, the lower copiously compound. Leaves of the lower plane much spaced, ascending, except in the lower part of the main stem, ovate-oblong, obtuse, $\frac{3}{4}$–1 lin. long, bright green, membranous, very unequal-sided, cordate, serrulate, and much imbricated over the stem on the upper side at the base; leaves of the upper plane very small, ovate, cuspidate. Spikes copious, short, resupinate, above 1 lin. diam.; bracts very dimorphous, those of the upper plane crowded, lanceolate-rhomboid, bright green, the lower subpatent; those of the lower plane ascending, suborbicular, with a large cusp.

Hab. Bombay Ghauts, *Dalzell*! A near ally of *S. chrysorhizos*.

285. S. AUREOLA Spring Mon. ii. 244. — Stems densely tufted, slender, erect, 4–6 in. long, copiously pinnate, the branches erecto-patent, the lower copiously compound. Leaves of the lower plane spaced even on the branchlets, rather ascending, ovate-oblong, obtuse, $\frac{1}{2}$ lin. long, bright green, membranous, unequal-sided, more produced on the upper side of the midrib, not ciliated, broadly rounded on the upper side at the base, and imbricated over the stem; leaves of the upper plane very small, ovate-cuspidate. Spikes $\frac{1}{6}$–$\frac{1}{4}$ in. long, $\frac{1}{2}$ lin. diam., resupinate; bracts obscurely dimorphous, those of the upper plane lanceolate-rhomboid, erecto-patent, only projecting beyond the ovate acute ascending bracts of the lower half of the spikes.

Hab. Khasia Mountains, *Griffith*!

286. S. DALZELLII Baker.—*Lycopodium cæspitosum* Dalz. in Hook. Kew Journ. iv. 114, non Blume.—Stems erect, tufted, slender, pale straw-coloured, 4–6 in. long, copiously pinnate, the branches erecto-patent, the lower copiously compound. Leaves of the lower plane nearly contiguous on the branchlets, spaced on the main

stem, all erecto-patent, oblong-lanceolate, acute, ½ lin. long, bright green, membranous, nearly equal-sided, strongly ciliated, broadly rounded, and a little imbricated over the stem on the upper side at the base; leaves of the upper plane half as long, ovate, with a large cusp. Spikes short, copious, resupinate, 1 lin. diam.; bracts very dimorphous, those of the upper plane ovate-lanceolate, erecto-patent, bright green; those of the lower plane pale, ascending, ovate-cuspidate.

Hab. Bombay Ghauts, *Dalzell*! With *S. miniatospora*.

287. **S. pelagica**, n. sp. — Stems densely tufted, often forked from the base, very slender, erect, 3–4 in. long, pinnate, the branches ascending, the lower copiously compound. Leaves of the branchlets ascending and nearly contiguous, of the main stem spaced and spreading, oblique oblong, obtuse, ½–1 lin. long, dark green, membranous, unequal-sided, broadly rounded, shortly ciliated, and a little imbricated over the stem on the upper side at the base; leaves of the upper plane one-third as long, oblong, with a large cusp. Spikes short, copious, resupinate, ¾ lin. diam.; bracts not very dimorphous, those of the upper plane oblique ovate-lanceolate, erecto-patent; of the lower plane ovate-cuspidate, ascending.

Hab. Fiji Islands, *Seemann* 705!

288. S. GLAUCA Spring Mon. ii. 252. — Stems slender, erect, ½ ft. long, simple at the base, copiously pinnate above it, the branches erecto-patent, the lower copiously compound. Leaves of the lower plane contiguous on the branchlets, spaced on the main stem, all much ascending, oblique ovate, acute, ½–1 lin. long, bright green, rather firmer in texture than its neighbours, much dilated, obscurely ciliated, broadly rounded, and much imbricated over the stem on the upper side at the base; leaves of the upper plane half as long, oblique ovate, acute. Spikes copious, short, resupinate, ¾ lin. diam.; bracts of the upper plane ovate, acute, dark green, erecto-patent; of the lower plane more ascending, pale green, orbicular, with a cusp.

Hab. Forests of Assam, *Mrs. Mack*!

289. S. CHRYSORHIZOS Spring Mon. ii. 251. — Stems densely tufted, very slender, erect, 3–4 in. long, copiously pinnate, the branches erecto-patent, the lower and middle ones considerably compound. Leaves of the lower plane spaced even on the branchlets, oblique oblong, subobtuse, rather ascending, ½ lin. long, membranous, bright green, more produced on the upper side of the midrib, serrulate on the upper edge, broadly rounded on the upper side at the base, and imbricated over the stem: leaves of the upper plane very small, ovate, cuspidate. Spikes short, copious, resupinate, 1 lin. diam.; bracts very dimorphous, those of the upper plane oblong-rhomboid, bright green, erecto-patent; of the lower very small, pale green, ovate, with a large cusp.

Hab. Assam, Khasia Mountains, and Tenasserim. Doubtfully distinct as a species from *S. chrysocaulos*.

290. S. CRASSIPES Spring Mon. ii. 243. — Stems 6–9 in. long, erect, pale yellow, a line diam. at base, copiously pinnate, the

erecto-patent branches copiously compound. Leaves of the lower plane spaced even on the branchlets, the upper ascending, the lower spreading, oblique ovate, acute, ¾–1 lin. long, bright green, membranous, much dilated on the upper side of the midrib, very cordate, serrulate, and much imbricated over the stem on the upper side at the base; leaves of the lower plane half to one-third as long, ovate, cuspidate. Spikes copious, resupinate, ¼–½ lin. long, 1 lin. diam.; bracts very dimorphous, those of the upper plane oblique ovate-lanceolate, erecto-patent; those of the lower plane pale green, orbicular, with a large cusp.

Hab. Woods of Ceylon, at about 5000 ft., *Gardner* 1274! *Col. Walker*! A near ally of the Himalayan *S. chrysocaulos.*

291. S. CHRYSOCAULOS Spring Mon. ii. 250. — *S. subdiaphana* Spring. — *S. hypnoides* Spring Mon. ii. 101. — *Lycopodium chrysocaulon* Hook. & Grev. — *L. subdiaphanum* Wall. — Stems densely tufted, slender, erect, bright yellow, ½–1 ft. long, copiously pinnate, the short erecto-patent branches copiously compound. Leaves of the lower plane spaced even on the branchlets, more or less ascending, oblique ovate, acute, ¾–1 lin. long, bright green, membranous, very unequal-sided, broadly rounded, serrulate, and a little imbricated over the stem on the upper side at the base; leaves of the upper plane one-third to one-half as long, ovate, distinctly cuspidate. Spikes copious, short, resupinate, 1 lin. diam.; bracts very dimorphous, those of the upper plane crowded, erecto-patent, ovate-lanceolate; of the lower plane shorter, paler, ascending, broad ovate, with a large cusp.

Hab. Common in the Eastern and Central Himalayas, ascending to 7000–8000 ft. in Kumaon. Moulmein, *Parish* 118! Penang, *Wallich*!

292. S. TENUIFOLIA Spring Mon. ii. 253.—Stems tufted, suberect, a span long, copiously pinnate, the erecto-patent branches copiously compound. Leaves of the lower plane subcontiguous and erecto-patent on the branchlets, spaced and spreading on the main stem, ovate- or oblong-rhomboid, subacute, 1-12th to 1-8th in. long, pale green, membranous, much dilated, cordate, serrulate, and imbricated over the stem on the upper side at the base; leaves of the upper plane one-third as long, ovate, with a large cusp. Spikes short, copious, resupinate, 1 lin. diam.; bracts very dimorphous, those of the upper plane lanceolate-rhomboid, bright green, erecto-patent; those of the lower plane ascending, pale, broad ovate, cuspidate.

Hab. Mishmi and Khasia Mountains, *Griffith*!

293. S. LAXA Spring Mon. ii. 246.—Stem suberect, a span long, pinnate, the erecto-patent branches copiously compound. Leaves of the lower plane spaced even on the branchlets, ovate-oblong, subobtuse, a line long, membranous, unequal-sided, both margins denticulate, rather narrowed to a slightly emarginate base; leaves of the upper plane half to one-third as long, obovate, acuminate. Spikes short, resupinate, 1 lin. diam.; bracts of the upper plane oblong-lanceolate, very acute, erecto-patent; of the lower plane ovate-cuspidate.

Hab. Tahiti, *Morrenhout.*

294. S. TENERA Spring Mon. ii. 241. — *Lycopodium tenerum* Hook. & Grev. — Stems ½–1 ft. long, erect from the base or decumbent in the lower part, not so stout as in *suberosa*, copiously pinnate, the flaccid erecto-patent branches copiously compound. Leaves of the lower plane ascending and nearly contiguous on the branchlets, much spaced and spreading or rather squarrose on the main stem, oblong-rhomboid, subacute, 1-12th to 1-8th in. long, bright green, very membranous in texture, unequal-sided, much dilated, broadly rounded, serrulate, and a little imbricated over the stem on the upper side at the base; leaves of the upper plane very small, lanceolate-cuspidate. Spikes short, resupinate, 1 lin. diam; bracts of the upper plane lanceolate-rhomboid or the upper ovate, erecto-patent; of the lower plane ascending, ovate-cuspidate.

Hab. Mountains of Peninsular India and Ceylon. *L. Macræi* and *calostachyon* of Hooker & Greville, the latter cited by Spring under *S. ciliaris*, both seem to be small forms of this species, and I cannot distinguish from it by any definite character *S. debile* Spring Mon. ii. 122 (*Lycopodium debile* Bory in Belang. Voy. ii. 8, tab. 1, fig. 1), from Java and the Malay Peninsula, and *S. aristata* Spring Mon. ii. 245, from the Philippines, *Cuming* 1996!

295. S. MYOSUROIDES Spring Mon. ii. 236. — *Lycopodium myosuroides* Kaulf. — Stems ascending, a span long, copiously pinnate, the lower branches copiously compound. Leaves of the lower plane spaced, oblong-lanceolate, acute, ⅛ in. long, light green, membranous, nearly equal-sided, ciliated on the upper side at the base; leaves of the upper plane very small, cuspidate. Spikes resupinate, ½ in. long; bracts of the upper plane subimbricated, erecto-patent, oblique lanceolate; of the lower plane ascending, ovate-cuspidate.

Hab. Manilla, Philippine Islands, *Chamisso*. Habit like that of *S. Menziesii*.

296. S. SUBEROSA Spring Mon. ii. 252. — Stems densely tufted, suberect, often above a foot long, pale shining brown, ⅛ in. diam. at the base, copiously pinnate, the branches erecto-patent and decompound, the root-fibres sometimes extending half-way up it. Leaves of the lower plane spaced and erecto-patent on the branches, very distant and spreading on the main stem, oblique lanceolate or ovate-lanceolate, acute, bright green, membranous, unequal-sided, much produced, broadly rounded, shortly ciliated, and a little imbricated over the stem on the upper side at the base; leaves of the upper plane half as long, oblong, with a large cusp. Spikes copious, ¼–¾ in. long, ⅛–⅙ in. diam., resupinate; bracts of the upper plane lanceolate, erecto-patent; of the lower plane ascending, ovate, with a large cusp.

Hab. Khasia Mountains, Sikkim, Assam, Malay Peninsula.

(To be continued.)

SHORT NOTES.

Tulipa sylvestris in Northamptonshire.—This plant was found in flower, in April, at Courteenhall, Northants, by Sir Herewald Wake, who kindly gave me a specimen. It seems to be undoubtedly the wild plant, and has not been hitherto recorded for the county. Sir Herewald Wake tells me that he has noticed the plant for several years, but this is the first time he has seen it in flower.—H. N. Dixon.

Carex elongata L. in Scotland. — Mr. J. McAndrew has sent specimens of the above species from Kenmore Holms, in Kirkcudbrightshire, extending its northern distribution from Cumberland. It grows at the same station where Mr. McAndrew found *Calamagrostis lanceolata* last year, its only certain Scottish habitat.—Arthur Bennett.

Calamagrostis strigosa Hartm. in Britain. — In Dr. Smiles' 'Life of Robert Dick, of Thurso,' it is mentioned that Dick found at Loch Duran, Caithness, "the Lapland Rush, *Calamagrostis lapponica*" (of Hooker, not of Wahlberg). When calling Mr. J. Grant's attention to this, he wrote, "The Loch is now (1883) drained, and I fear the plant is lost, but there are many specimens in Dick's Herbarium at Thurso." Mr. Grant supposed those to be *C. stricta* Nutt.; and it was not until this year that he could make a thorough search of the marshy ground still left. He has been successful, and on sending me specimens the other day I found they were certainly not the Irish form, but were either *C. borealis* Læst. or *C. strigosa* Hartm.; but, having specimens of neither, I asked Mr. N. E. Brown, at Kew, to compare them. His answer was—"*C. strigosa* Hartm.; although the ligule is not so acute as the typical plant, still I do not see what else it can be." Nor do I, for although *C. stricta* Nutt. (= *Deyeuxia neglecta* Kunth) varies a good deal in the length of the glumes and hairs, still in *C. strigosa* the glumes are longer. I have specimens of *C. stricta* in which the glumes are nearly as long as described for *C. borealis*, which the Caithness plant resembles in this respect. It is a rare species in Europe, being only known for North Norway, Lapland, and Finland.—Arthur Bennett.

Castanea sativa Mill. as a Native of Britain.—The Spanish Chestnut has usually been considered as having very doubtful claims to be considered as indigenous to this country, as it comparatively rarely occurs in woods or other situations where it is not likely to have been planted. Watson, Bentham and Sir J. D. Hooker regard it as alien to Britain, as also does Nyman (Consp. Fl. Europ.). What seems conclusive evidence as to its having occurred in our island from very early times is furnished by a small fragment of the wood which I recently obtained during an excursion of the Geologists' Association, in a brick-earth pit between Erith and Crayford, Kent. In this pit the chalk has been eroded to a very considerable depth, and the depression has been filled up with brick-earth deposited in the old river-bed. It was in the lowest part of this stratum that the wood was found, together with palæolithic flint-flakes. Bones of the rhinoceros have been also found in the same pit, and in contemporaneous deposits remains of two other species of rhinoceros, the mammoth, and Irish elk, together with bones of still existing animals. There can be no doubt, therefore, of the date of the fragment, and it is hardly likely to have been introduced at so early a date. It is to be regretted that so little attention has been paid to the flora of Pleistocene times. Remains of plants have been found from time to time, but have been generally disregarded and not preserved.—H. N. Ridley.

Fruit and Seed of Eomecon chionantha.—Although I have had this interesting plant in cultivation ever since its discovery, I have not been able to coax it to ripen fruit. It has, however, set one or two this spring in the Hongkong Gardens, and I am indebted to the courtesy of Mr. Ford, the Superintendent, for the opportunity of examining one of these; and am thus enabled to render the generic character more complete:—

Capsula stipitata, oblonga, a basi usque ad apicem dehiscens, valvis placentas duas cum stylo persistente nudantibus. Semina oblonga, testa crustacea, pallide brunnea, in sicco tuberculata, raphe cristata. Embryo minutus, juxta basin albuminis carnoso-oleosi, flaventis, situs.

It will be seen that *Eomecon* differs (so far as carpological characters are concerned) from *Sanguinaria* only by the capsule-valves becoming free from the base and remaining attached at the apex, instead of the contrary mode of dehiscence, and by the seeds being tuberculate and smooth.—H. F. Hance.

Vaccinium Forbesii.—In thus naming a new *Vaccinium* from Sumatra in Mr. H. O. Forbes' recent work, 'Wanderings of a Naturalist' (p. 278), I overlooked a species from Africa already named *Vaccinium Forbesii* by Sir W. J. Hooker; I therefore propose the name *V. Dempoense* for the Sumatran species, from the locality, Mount Dempo, where Mr. Forbes discovered it.—W. Fawcett.

NOTICES OF BOOKS.

The first volume of the Botany of 'The Voyage of H.M.S. Challenger' has appeared; it is entirely the work of Mr. W. B. Hemsley, whose name, strangely enough, does not appear on the title-page. The book, which is published at £2, contains four memoirs:—i. Report on our present state of knowledge of various Insular Floras (pp. 75); ii. Report on the Botany of the Bermudas (pp. 135, tt. 13); iii. Report on various other Islands of the Atlantic and Southern Oceans (pp. 299, tt. 39); iv. Report on Juan Fernandez, South-eastern Moluccas, and Admiralty Islands, with an appendix on the dispersal of plants by oceanic currents and birds (pp. 333, tt. 11). Each report is paged separately, but the plates are numbered consecutively—surely an awkward arrangement. The convenience of workers would have been consulted had each report been issued by itself, the bulky quarto volume being inconvenient for reference. We hope to refer at greater length to this very important contribution to our knowledge of plant-distribution.

Messrs. Cassell & Co. send us the first number of 'Familiar Trees.' The name of the author, Mr. G. S. Boulger, is sufficient guarantee that the literary portion of the work will be well done.

Dr. Trimen has compiled a useful 'Systematic Catalogue of the Flowering Plants and Ferns indigenous to or growing wild in Ceylon,' arranged in accordance with the 'Genera Plantarum' and the 'Flora of British India,' so far as published. It is brought up to date, the new species now publishing in this Journal being included. The list, which forms a volume of 140 pages, may be obtained from Messrs. Dulau & Co., price 3*s.* 6*d.*

New Books.—T. Schube, 'Beiträge zur Kenntnis der Anatomie blattarmer Pflanzen' (Breslau, Kern: 8vo, pp. 30, tt. 2).—W. Zopf, 'Zur Morphologie und Biologie der Niederen Pilzthiere (Monadinen)' (Leipzig, Zeit: 4to, pp. 45, tt. 5). — K. Trimmer, 'Supplement to the Flora of Norfolk' (London, Jarrold: 8vo, pp. vii. 73: 5*s.* 6*d.*). — B. A. F. Pigott, 'Flowers and Ferns of Cromer' (London, Jarrold: 8vo, pp. 99: 2*s.* 6*d.*). — J. Dybowski, 'Traité de Culture Potagère' (Paris, Masson: 8vo, pp. xii. 491: 114 cuts).—G. Bizzozero, 'Flora Veneta Crittogamica. i. Funghi' (Padua: 8vo, pp. viii. 572). — H. Dingler, 'Die Flachsprosse der Phanerogamen. i. Phyllanthus § Xylophylla' (Munich, Ackermann: pp. v. 153, tt. 3).

Articles in Journals.

American Naturalist. — Lester F. Ward, 'Evolution in the Vegetable Kingdom.'—E. A. Southworth, 'Development of Stomata in the Oat' (1 plate). — C. E. Bessey, 'Opening of flowers of *Desmodium sessilifolium.*'

Botanical Gazette. — Autobiography of A. Fendler (contd.).—J. N. Rose, 'Notes on Conjugation of Spirogyra' (8 plate).

Bot. Centralblatt. (Nos. 27, 28).—E. Heinricher, 'Einrichtungen zur Wasserversorgung des Mesophylls.'

Bot. Zeitung (June 19. 26). — A. v. Lengerken, 'Die Bildung der Haftballen an den Ranken einiger Arten der Gattung *Ampelopsis.*' — (July 3, 10, 17, 24). A. Meyer, 'Ueber die Assimilationsproducte der Laubblätter angiospermer Pflanzen.'—(July 10). F. Michelis, 'Ueber Fasciationen von *Taraxacum.*'

Bull. Soc. Bot. France (xxxii: Comptes Rendus 4). — M. Gandoger, 'Sur l'*Hyoscyamus Faleslez* et la *Guiraoa arvensis.*' — E. Cocardas, 'Le *Penicillium* ferment dans les extraits pharmaceutiques' (1 plate). — A. Franchet, 'Sur l'origine spontanée du *Saxifraga Fortunei.*' — P. Duchartre, 'Influence de la sécheresse sur l'Igname de Chine.' — G. Bonnier, 'Sur le développement et la structure des rhizomes d'*Anemone nemorosa.*' — N. Patouillard, 'Sur un genre nouveau d'Hyménomycètes (*Helicobasidium*).' — —. Constantin & —. Morot, 'Sur l'origine des faisceaux libéro-ligneux surnuméraires dans la tige des Cycadées.' — G. Bonnier & L. Mangin, 'Sur le respiration des plantes aux différentes saisons.' — E. Heckel, 'Sur le *Barringtonia intermedia* Miers.' — P. Vuillemin, '*Puccinia Thlaspidis* sp. n.' — L. du Sablon, 'Sur le développement du sporogone du *Frullania dilatata.*'

Bull. Torrey Bot. Club (May). — J. F. Kemp, 'Winter Flora of Bermudas.' — N. L. Britton, 'Note on *Veronica Anagallis.*' — J. S. Newberry, 'Relations of *Pinus edulis* and *P. monophylla.*' — J. Schaarschmidt, 'Desmids new to U. States' (*Cosmarium Reinschii*, sp. n.).—E. P. Bicknell, 'Cleistogamy in *Lamium.*'

Flora (May 11, 21, June 1). — H. Fischer, 'Ein Beitrag zur vergleichenden Anatomie des Markstrahlgewebes und der jährlichen Zuwachsonen im Holzkörper von Stamm, Wurzel und Aesten bei *Pinus Abies.*' — (May 21). W. Nylander, 'Addenda nova ad Lichenographiam europæam.' — H. G. Reichenbach, *Saccolabium coeleste*, *Cyrtopodium Saintlegerianum*, spp. nn.—(June 11, 21). W. Nylander, 'Arthoniæ novæ Americæ borealis.'—J. Müller, 'Lichenologische Beiträge xxi.' — (June 11). H. Leitgeb, 'Wasserausscheidung an den Archegonständen von *Corsinia.*'—(July 1). K. Schliepacke, 'Zwei neue Laubmoose aus der Schweiz (*Pleuroweissia* (n. gen.), *Schliephackei* Limpr., *Bryum Graefianum* Schlieph.): tt. 2). — P. G. Strobl, 'Flora der Nebroden' (contd.). — (July 11). J. Velenovsky, 'Ueber den Blüthenstand des *Cardiospermum Halicascabium*' (1 plate). — H. G. Reichenbach, 'Comoren Orchideen Herrn Leon Humblot's' (*Disperis Humblotii*, *Vanilla Humblotii*, *Galeola Humblotii*, *Pogonia Barklyana*, *Eulophia megistophylla*, *Angræcum rostellare*, *A. florulentum*, *Aeranthus Leonii*, *A. Grandidieranus*, *A. denticus*, *A. rutilns*, spp. nn.).

Gardeners' Chronicle (July 11). — *Aretotis Leichtliniana* Lynch, *Aglæonema acutispathum* N. E. Br., *Tenaris rostrata* N. E. Br., spp. nn. — *Aloe insignis* ×, N. E. Br. (fig. 8). — M. T. Masters, 'Hybrid Passionflower.' — W. G. Smith, *Oidium fructigenum* (figs. 11, 12). — (July 18). *Govenia sulphurea*, *Zygopetalum laminatum*, *Epidendrum punctatum*, spp. nn. (all of Rchb. f.).—*Aeranthus leonis* (figs. 17, 18).—(July 25). *Lissochilus Krebsii* var. *purpurata* Ridley, n. var. — C. B. Plowright, *Puccinia Vineæ* and *Æcidium Botæ* (figs. 22, 23).

Nuov. Giorn. Bot. Italiano.—G. Venturi, 'La sezione *Harpidium* nella briologia italiana.' — A. Piccore, 'Spigolature per la ficologia ligustica.'—C. Massalongo, 'Epatiche raccolte alla Terra del Fuoco' (tt. 17).—A. Terracciano, 'Intorno ad una capsula quadriloculare e contributo all' anatomia del pistillo nell' *Agave striata.*'—T. Caruel, 'Su di una virescenza di Verbasco.'

Œsterr. Bot. Zeitschrift. — C. Schiedermayr, Memoir of Robert Rausscher (b. 1806, portrait). — D. Hirc, 'Flora von Croatien.'—E. Formánek, 'Flora des böhmisch-mährischen Schneegebirges' (contd.).—E. Fick, 'Botanische Streifzüge in Russland' (contd.).

ON THE CAULOTAXIS OF BRITISH *FUMARIACEÆ.*

By Thomas Hick, B.A., B.Sc.

The term "caulotaxis" is here used in the sense defined in a previous communication to this Journal,[*] *viz.*, as a designation for the arrangement and relation of the central and lateral axes of a plant.

Every practical botanist is aware that plants exhibit some variety in their modes of branching, and that the relative positions of the main axis and the branches are often much modified as these parts pass from the rudimentary to the mature condition. Of the latter fact examples are by no means difficult to meet with among British plants, though these are seldom or never referred to, even in our native text-books on Botanical Science. Hence an account of the caulotaxis of British *Fumariaceæ* may not be without some interest, and may possibly afford a clue to the explanation of other and more complicated cases.

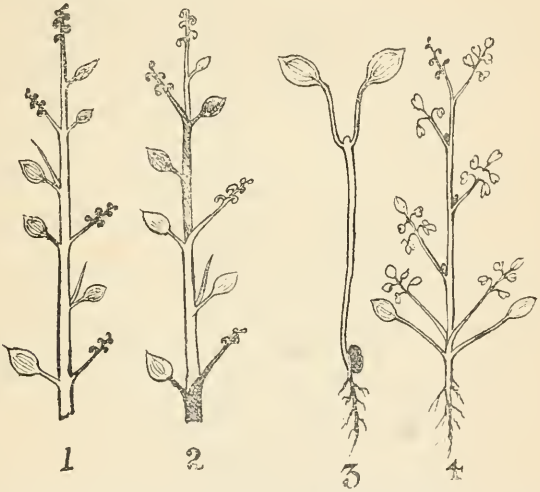

Fig. 1. Empirical diagrammatic view of *Corydalis claviculata*. 2. Rational do. 3. Seedling of do. 4. Young plant bearing its first inflorescence.

A convenient starting-point will be afforded by the following description of the axis of *Corydalis claviculata*, drawn up some time ago The specimen consisted of six internodes, which formed the terminal portion of one of the long slender shoots characteristic of this species. As the specimen lay before me, the following points were noted :—At the *first node*, i.e., the lowest on the specimen, there was *a leaf on the left*,† and a peduncle bearing flowers on the right, so that the inflorescence was what systematists term *leaf-opposed.* At the *second node* there was *a leaf on the right*, with a lateral branch in its axil; the axillary branch *terminated* in three flowers, just below which was a leaf with an axillary branch of the second order. At the *third node* the *leaf was on the left*, and opposite to it was a peduncle bearing flowers. At the *fourth node* there was *a leaf on the left*, with an axillary branch. At the *fifth node* the *leaf was on the right*, and a leaf-opposed peduncle on the left. At the *sixth node* there was *a leaf on the right*, and from this point the stem was continued into a peduncle with flowers, so that here *the peduncle was terminal.*

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[*] 'Journal of Botany,' Oct., 1882.

† It need hardly be said that the terms left and right, as used in this description for the successive leaves, are not to be taken strictly as indicating a distichous phyllotaxis.

From this it appears that, in the specimen described, leaf and axillary branch alternated regularly with leaf and opposed peduncle. Many other specimens subsequently examined exhibited essentially the same organisation, the inflorescences being invariably leaf-opposed, except at the apex of the shoots, where they are terminal. We may take it, therefore, that there is some reason for regarding this as the typical arrangement of leaves, branches, and inflorescences, and they may represent it diagrammatically as in Fig. 1.

Interpreting the arrangement on the same principles as were applied to the Geraniums,* it will be obvious that the long slender shoots of this plant are in reality *pseudaxes* or *sympodia*, each one being made up of a series of successive lateral branches, which have become organised into a continuous axis. The leaf-opposed peduncles are thus the terminal portions of each section of the pseudaxis, which have become pushed aside by the more vigorous growth of the lateral shoots. Hence a rational view of the whole structure may be represented as in Fig. 2.

For descriptive purposes it will be convenient in future to speak of the sections of the pseudaxis as "*caulomeres*," and to distinguish the caulomeres as uninodal, binodal, &c., according to the number of nodes they carry. Those with more than three nodes may be termed multinodal. Using this language, the shoots of the specimens referred to may be described as pseudaxes, built up of binodal caulomeres. As stated, however, these were but the terminal portions of the shoots, and it became necsssary therefore to see whether the same structure obtained in the older parts. For this purpose it was deemed best to have recourse to young plants, whose growth and development could be watched from the earliest stages until they reached maturity. The results, which are summarised in the next paragraph, show that the formation of pseudaxes, in the way described, practically prevails over the whole plant, the chief point of difference being that in the older portions, one, two, or a few of the caulomeres are of a higher order than the binodal.

In germination the hypocotyl elongates more or less, and raises the cotyledons above the soil, where, as is usual among dicotyledons, they present themselves as a pair of simple, entire, opposite leaves (Fig. 3). The leaves subsequently developed appear in pairs, which decussate regularly with one another, but the petioles of each pair are not inserted at the same level. The interval between them is scarcely perceptible at the base of the stem, but becomes considerable at higher levels, where the opposite and decussate phyllotaxis becomes changed into an alternate one (Fig. 4). This, it may be noted in passing, appears to be brought about by the elevation of one of the leaves of each pair, through unequal growth on opposite sides of the stem. The number of nodes between the cotyledons and the first inflorescence varies in different seedlings, but is generally an even number—four, six, or eight. In a few cases it *appears* to be odd, and may actually be so; but this only occurs, so far as observation has gone, when the phyllotaxis at the first node above the cotyledons is strictly opposite. In either case the first caulomere is multinodal. After the first two or three, however, the caulomeres usually become binodal, and so remain throughout the whole length of the pseudaxis, except in some instances, where they change again near the apex and become uninodal. Thus, as a rule, each adds two leaves and two internodes to the principal axis, and then runs out into an inflorescence. The lower leaf of each often produces an axillary branch, whose organisation agrees with that of the principal axis, except that the basal caulomere is not of the same order in all cases. As intimated above, therefore, the whole plant is built up of a series of pseudaxes, one of which constitutes the main axis, while the rest form the so-called lateral branches. Moreover, the caulomeres are for the most part binodal, only the basal ones being of a higher order and the apical ones of a lower.

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* *Loc. cit.*

The other species of *Corydalis* included in British Floras, viz., *C. solida* and *C. lutea*, are not regarded as true natives, though they are occasionally met with. No opportunity of studying their development has presented itself, but an examination of herbarium specimens is instructive. In *C. solida* the stem is usually simple, consisting of but a single multinodal caulomere, which terminates in a racemose inflorescence. Here, then, the organisation of the axis is reduced to its simplest form, and corresponds to that of the basal caulomere of *C. claviculata*. In *C. lutea* the stem is more or less branched, but both principal and subordinate shoots are pseudaxes, built up of caulomeres, which, except at the base and the apex, are generally binodal.

Turning now to *Fumaria*, the other genus of the order, we find a caulotaxis in general agreement with that of *Corydalis*, though presenting minor modifications. Complete specimens of *F. officinalis* show that the phyllotaxis is at first opposite and decussate, but quickly becomes tetrastichous. Between the foliaceous cotyledons and the first inflorescence eight leaves are often met with, though there is some variety in this respect. Thus, the first caulomere is of a high order, but the rest are for the most part binodal, except at the apex, where they may become uninodal. *Fumaria capreolata* is in close agreement with *F. officinalis*. The only point that need be referred to is, that here the leaves display a greater tendency to produce two buds in their axils, instead of one. When this occurs at a node which carries a leaf-opposed inflorescence, it somewhat perplexes the observer at first, but further examination shows that the production of a second bud is a common feature at the other nodes also, where it occupies the same relative position, *viz.*, between the leaf and the axillary shoot. As might be expected, the subspecies *F. confusa* Jord. agrees in the main with its type; and the same may probably be said of the subspecies *F. muralis* Sonder., though further observations are necessary to remove the qualification.

Of the species *F. densiflora* DC. and *F. parviflora* Lamk., only a few herbarium specimens have been examined, but these show both unanimity among themselves and conformity to the organisation of the species described. Thus, throughout the whole of this order, as represented in the British Isles, a remarkable unity of organisation prevails. In all cases, save that of *Corydalis solida*, the main stem is a sympodium or pseudaxis, composed of binodal caulomeres, except in the basal region, where they are of a higher order, and often in the apical region also, where they become uninodal.

LIST OF EUROPEAN CARICES.

By Dr. H. Christ.

[We reprint the following list from the 'Comptes-rendus' of the Société Royale de Botanique de Belgique, vol. xxiv., pt. 2, pp. 10–20. Mr. Ridley has kindly added foot-notes, to which his initials are affixed, on four of the doubtful species.—Ed. Journ. Bot.]

Je me suis proposé de rédiger un catalogue général qui a pour but d'établir les affinités naturelles des espèces du genre *Carex*. Vu les difficultés nombreuses qui retardent l'achèvement de ce travail, je crois être utile à quelques botanistes qui cultivent ce genre en donnant, pour le moment, l'énumération des espèces d'Europe y compris les Iles atlantiques : Azores, Madère, Canaries, dans leur groupement naturel tel que je l'entends. Ce catalogue pourra servir à rectifier en quelques points la liste donnée par M. Nyman, dans la 2me édition de son 'Conspectus Floræ Europææ.'

J'ai fais mention des espèces douteuses pour attirer l'attention des botanistes sur ces formes. Je saurais gré à ceux qui pourraient me communiquer des spécimens de ces formes critiques.*

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* Outre les formes douteuses mentionées dans ce travail, je désirerais recevoir, à prix d'argent ou en échange d'autres plantes, les espèces suivantes : *C. punctata* Gaud. var. *lævicaulis* Hochst., *C. floresiana* Hochst., *C. Vulcani* Hochst., *C. Hochstetteriana* Gay, *C. rigidifolia* Gay, *C. asturica* Reut. et Boiss. non Willk., *C. azorica* Gay, *C. Griolettii* Roem. Ital., *C. cæsia* Griseb., *C. aperta* Boott. Ross., *C. elytroides* Fries, *C. limula* Fries, *C. Lyngbyei* Hornem., *C. cryptocarpa* C. A. Mey, *C. spiculosa* Fries, *C. macilenta* Fries, *C. Guthnickiana* Gay, *C. Reuteriana* Boiss.

CAREX L.

I. HETEROSTACHYÆ.

Sect. 1. PSEUDO-CYPERUS.

1. C. PSEUDO-CYPERUS L.

Sect. 2. VESICARIÆ Fries p. p.

~~2. C. VESICARIA L.~~
Var. *Friesii* Blytt. forma reducta bor.
3. C. SAXATILIS L.
(Quid *C. Grahami* Boott? e Scotia nil nisi *C. saxatilem* syn. *C. pullam* Good. accepi).*
4. C. ROSTRATA With. (*C. ampullacea* Good.).
Var. *hymenocarpa* Drej. forma reducta bor.
5. C. ROTUNDATA Wahlbg.
6. C. RHYNCHOPHYSA C. A. Mey.

Sect. 3. PALUDOSÆ.

7. C. PALUDOSA Good.
C. Kochiana DC. lusus glumis ♀ elongatis.

Sect. 4. ARISTATÆ Carey p. p.

8. C. RIPARIA Curt.
Var. *gracilescens* Hartm.
9. C. ORTHOSTACHYA C. A. Mey.

Sect. 4. LASIOCARPÆ Fries.

10. C. FILIFORMIS L.
C. filiformi-paludosa Uechtritz.
C. filiformi-riparia Wimm. (*C. evoluta* Hartm.).
11. C. NUTANS Host.
12. C. HIRTA L.
C. hirto-vesicaria Wimm. (*C. Siegertiana* Uechtr.).
(Quid *C. lasiochlæna* Kunth? Ex ic. Boott. illustr., No. 371, est *C. hirta* quædam *elongata* et *luxurians*. Nec Moris nec recentiores tale quid in Sardinia legerunt).

Sect. 6. FULVELLÆ Fries p. p.

13. C. HORDEISTICHOS Vill.
14. C. SECALINA Wahlbg.
Sec. Boeckeler Linnea, 1877, p. 280, var. *microcarpa* prioris mihi species distincta.
15. C. BREVICOLLIS DC.
C. asturica Willk. non Reut. et Boiss. est forma subalpina.
~~16. C.~~ MICHELII Host.
17. C. BINERVIS Sm.
18. C. DISTANS L.
19. C. DILUTA M. Bieb.
20. C. PUNCTATA Gaud.
Var. *lævicaulis* Hochst. Ins. Azor. rostro longiore pedunc. læv.
21. C. HORNSCHUCHIANA Hoppe.
C. Hornschuchiana-flava Al. Br. syn. *C. fulva* Good. et *C. xanthocarpa* Degl.

Sect. 7. FLAVÆ Carey.

22. C. FLAVA L.
Subsp. *C. lepidocarpa* Tausch.
23. C. ŒDERI Ehrh.
Var. *cyperoides* Marss. utriculis obtusissimis.
Var. *nevadensis* Boiss. forma alpina.
24. C. EXTENSA Good.
Var. *nervosa* Desf. mediterr.
25. C. MAIRII Coss.
Subspec. *C. Loscosii* Lange an hybrid?
(Quid: *C. Duriæi* Steud. ex Boott, 440 dubiæ affinitatis).†

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* *C. Grahami* Boott was first described (Trans. Linn. Soc. xix. 215) from specimens collected by Wight in Glen Phee, Forfar. *C. vesicaria* var. *alpigena* Fries is added as a synonym. Wight's plant, of which there are specimens in the Herbarium of the British Museum, is intermediate between *C. vesicaria* and *C. pulla*, being taller and with paler spikes than the latter. It seems to be less frequent than *C. pulla*, or less frequently collected. Hooker, in the 'Students' Flora,' ed. iii., p. 464, makes both it and *pulla* subspecies of *C. vesicaria*, which certainly seems the correct view to take of the male plants.—H. N. R.

† *Carex Duriæi* Steud. was based on a plant distributed by Durieu, in his Plant. Sel. Hisp. Lusit., No. 204. under the name *C. filifolia* Gay, specimens of

Sect. 8. Phyllostachyæ Torr. et Gray.

26. C. olbiensis Jord.
27. C. depauperata Good.

Sect. 9. Illegitimæ.

28. C. Linkii Schk.
29. C. illegitima Cesati.

Sect. 10. Strigosæ Fries.

30. C. capillaris L.
31. C. strigosa Huds.
32. C. silvatica Huds.
C. *laxula* Tin. lusus minor.
33. C. floresiana Hochst. Ins. Azor. Ex Boeckeler Linnea, 1876, p. 437, forma minor *C. Vulcani* Hochst. sed potius sp. propria. Conf. Seubert. Fl. Azor., tab. iii.
34. C. Vulcani Hochst. Ins. Azor. (Quid: *C. Perraudieriana* Gay ined. ex Durieu affinis *C. silvaticæ* Huds. ? Anaga, Teneriffa. Bull. Soc. bot. France, iii., 1856, 685).
35. C. lævigata Sm.
36. C. Hochstetteriana Gay. Ins. Azor.
Subspec. *C. rigidifolia* Gay, Ins. Azor.
37. C. Camposii Boiss.
38. C. microcarpa Salzm.
39. C. pendula Huds.
Var. *myosuroides* Lowe elongata. Ins. Azor. et Mader. an eadem ac *C. Welwitschii* Boiss. Lusitaniæ ? *

Sect. 11. Pallescentes Carey.

40. C. pallescens L.

Sect. 12. Paniceæ Carey.

41. C. pilosa Scop.
42. C. vaginata Tausch.
43. C. asturica Reut. et Boiss. non Willk.
44. C. panicea L.
C. pelia Lange est forma depauperata bor.
45. C. livida Wahlbg.

Sect. 13. Digitatæ Fries.

46. C. pedata Wahlbg.
47. C. pediformis C.-A. Mey.
48. C. digitata L.
49. C. ornithopoda Willd.
Var. *ornithopodioides* Hausm. lævis, alpina.
50. C. alba Scop.
51. C. humilis Leyss.

Sect. 14. Montanæ Carey.

52. C. Halleriana Asso.
Var. *Lerinensis*, major, glumis productis.
53. C. ambigua Link (*C. œdipostyla* Duval-Jouve).
54. C. pilulifera L.
Var. *azorica* Gay. Ins. Azor., conferta, sæpius 2 gyn.
55. C. obesa All.
Var. *conglobata* Kit., forma reducta orient.
56. C. supina Wahlbg. incl. *C. obtusata* Garcke non Liljebl. forma submonostachya marcida.
57. C. ericetorum Poll.
Var. *membranacea* Hoppe, alpina squam. ♀ integr.
58. C. montana L.
(Quid: *C. Csetzii* Janka ?).

Sect. 1~~4~~5. Præcoces.

59. C. præcox Jacq. (*C. mixta* Miégev.) forma tenuis Pyren.

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which are in the British Museum Herbarium. It seems to be a very rare plant, for I have seen no specimens elsewhere collected. It is doubtless correctly placed in the section *Flavæ*, and seems more nearly allied to *C. flava* than to any other European species.—H. N. R.

* *C. Welwitschii* Boissier, as represented in Welw. Herb. It. Lusit., No. 574, is in no way related to *C. pendula*, but is very near, if not identical with, *C. lævigata* Sm.—H. N. R.

60. C. polyrrhiza Wall.
61. C. depressa Link (*C. basilaris* Jord.).
    Var. *transilvanica* Schur., minor.
    Fere eadem *C. dimorpha* Brot. Lusitan.

Sect. 16. Tomentosæ.

62. C. tomentosa L.
    Var. *cæsia* Griseb., utricul. striatis.
63. C. Grioletii Roem. (a *C. virescenti* Muhlb. Am. bor. diversissima).
    (Quid: *C. subvillosa* M. Bieb. ?).*

Sect. 17. Frigidæ Fries.

64. C. fuliginosa Schk.
    Var. *misandra* R. Br., forma reducta bor.
65. C. frigida All.
    Var. *pyrenaica*, spic. subglobosis approximatis.
66. C. ferruginea Scop.
    Var. *tenax* Reuter Act. Soc. Haller. non Chapman Alp. merid.
67. C. tristis M. Bieb. species distincta in primis caucasica leg. Brotherus.
68. C. sempervirens Vill.
69. C. lævis Kit.
70. C. firma Host.
71. C. fimbriata Schk.
72. C. macrolepis DC.
73. C. mucronata All.

Sect. 18. Limosæ.

74. C. laxa Wahlbg.
75. C. limosa L.
    Subspec. *C. magellanica* Lam. syn. *C. irrigua* Sm.
76. C. rariflora Sm.
77. C. Stygia Drej. spec. distincta sibir. leg. Sommier.
78. C. ustulata Wahlbg.

Sect. 19. Atratæ.

79. C. atrata L.
    Var. *aterrima* Hoppe, elongata scabra.
80. C. nigra All.
81. C. alpina Sw.
    Var. *inferalpina* Wahlbg. elongata.
82. C. Buxbaumii Wahlbg.

Sect. 20. Bicolores Nym.

83. C. bicolor All.
84. C. rufina Drej.
85. C. ursina Dew. ex specim. a Th. Fries in ins. Spitsbergen lectis hic collocanda.

Sect. 21. Glaucæ Nym.

86. C. hispida Schk.
    C. longearistata Biv., lusus glumis ♀ elongatis.
87. C. glauca Scop.
    Var. *serrulata* Biv. (*C. acuminata* Willd.) est form. intermedia.
    Subspec. *C. clavæformis* Hoppe syn. *C. Prætutiana* Parl.!

Sect. 22. Acutæ Carey.

a. *Maritimæ* Nym. p. p.

88. C. maritima L.
    C. Lyngbyei Horn., forma reducta.
    C. cryptocarpa C.-A. Mey, forma ex Boott intermedia *C. maritimam* et *C. salinam* Wahlbg.
89. C. salina Wahlb.
    C. subspathacea Wormsk. syn.

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* *C. subvillosa* M. Bieb. is represented in the British Museum by a sheet from the herbarium of Roemer and Schultes, on which are fastened two specimens of very young *C. tomentosa* and a single specimen of *C. præcox*. This is labelled "*Carex subvillosa*, Tauria," in Bieberstein's handwriting. The specimens of *C. tomentosa* do not show the fruit, which is ripe in *C. præcox*; so that if this sheet really represents Bieberstein's *subvillosa*, the description of the fruit was probably taken from that of *C. præcox*, and the species, being derived from an admixture of plants, must be expunged.—H. N. R.

C. epigeios Fries non Hartm., forma reducta bor.
C. halophila Nyl., forma squam. ♀ acuminatis.
C. hæmatolepis Drej., *C. kattegatensis* Fries, forma colorata.
C. spiculosa Fries ex. specim. a W. Boott. in Am. bor. lectis est forma sterilis salinæ.
(Quid: *C. discolor* Nyland.? a Boott. illustr. No. 384, ad *C. salinam*, a Nyman ad *C. discolorem* ducta.)

b. *Strictæ*.

90. C. BUEKII Wimm.
91. C. STRICTA Good.
Var. *gracilis* Wimm., leptostachya tenuifol.
Var. *turfosa* Fries, minor bor.

c. *Cæspitosæ* Fries p. p.

92. C. CÆSPITOSA Fries. syn. *C. pacifica* Drej.
C. APERTA Boott am. bor.! Rossia?

d. *Acutæ propriæ*.

93. C. ACUTA L.
C. prolixa Fries est lusus squam. ♀ elongatis.
Var. *spærocarpa* Uechtritz, utric. confert. minor. sphær.
Var. *panormitana* Guss., minor, glabrata, vaginata.
94. C. AQUATILIS Wahlbg.
Var. *epigeios* Hartm., form. bor. reducta.
95. C. TRINERVIS Degl.
96. C. VULGARIS Fries.
C. tricostata Hartm., forma intermedia inter *C. acutam* L. et *C. vulgarem* Fr.
Var. *juncella* Fries, elongata, tenuifolia, bor.
C. Reuteriana Boiss. videtur forma mont.
C. Dematranea Lagg. et *C. elytroides* Fries formæ inter *C. vulgarem* Fries et *rigidam* Good. intermediæ.
97. C. RIGIDA Good.
C. limula Fries et *C. decolorans* Wimm. formæ elongatæ.
98. C. INTRICATA Tineo. Species distincta, pumila, corsica et nebrodum.

II. HOMOSTACHYÆ.

Sect. 23. PANICULATÆ Carey.

~~99. C. PANICULATA~~ L.
100. C. PARADOXA Willd.
101. C. TERETIUSCULA Good.
C. teretiuscula-paniculata Beckm.
(Quid: *C. modesta* Gay?).

Sect. 24. OVALES Carey.

102. C. ELONGATA L.
Var. *Gebhardi* Willd., forma alp. et bor.
103. C. LEPORINA L.
C. argyroglochin Horn., lusus chloroticus.
Var. *sicula* Tineo, form. elongata, spic. distant.
104. C. FESTIVA Dew.
(Quid: *C. naufragii* Hochst. Steud. Boeckeler Linnea, 1875, 110?).

Sect. 25. SICCATÆ Carey.

105. C. SCHREBERI Schrank.
C. curvata Knaf., forma elongata.
C. Schreberi-arenaria, syn. *C. ligerina* Bor.
(Quid: *C. ludibunda* Gay?).
106. C. BRIZOIDES L.

Sect. 26. DISTICHÆ.

107. C. ARENARIA L.
Var. *colchica* Gay, glabrata.
108. C. DISTICHA Huds.
109. C. REPENS Bell. ex Boeckeler var. prioris, mihi distincta.

Sect. 27. DIVISÆ.

~~110. C.~~ DIVISA Huds.
C. chætophylla Steud., forma macra.
111. C. MONIZII Lowe. Ins. Mader. et Tenerif.

112. C. STENOPHYLLA Wahlbg.
113. C. CHORDORRHIZA Ehrh.
  C. gynocrates Auct. non Wormskjold, forma tenuis submonostachya.

Sect. 28. CANESCENTES Fries p. p.

114. C. REMOTA L.
  C. remota-paniculata Schwtz. syn. *C. Bœnninghauseniana* Weihe.
  C. remoto-echinata.
  C. remoto-leporina Ilse.
  C. remoto-brizoides Rchb. fil., syn. *C. Ohmuelleriana* Lange
  C. remoto-muricata Ritschl., syn. *C. axillaris* Good.
115. ~~C. CANESCENS L.~~
  Var. *vitilis* Fries, bor. et *C. Persoonii* Sieb., alp.
  C. canescens var. *subloliacea* Læstad. est forma filiformis.
  C. macilenta Fries ex Boott inter *C. loliaceam* L. et *C. tenuifloram* Wahlbg., sed potius forma misera canescentis.
116. C. NORVEGICA Willd.
117. C. LOLIACEA L.
118. C. TENUIFLORA Wahlbg.
119. C. TENELLA Schk.

Sect. 29. STELLULATÆ Carey.

120. C. ECHINATA Murr.
  Var. *grypos* Schk., forma alp. et bor.

Sect. 30. VULPINÆ Carey p. p.

121. C. VULPINA L.
  Var. *nemorosa* Rebent., forma angustifol.
  C. vulpino-paniculata Boruss. Rhenan.
122. C. MURICATA L. incl. *C. contigua* Hoppe et *C. Leersii* Schultz.
123. C. PAIRAEI Schultz, incl. *C. Chaberti* Schultz et *C. litigiosa* Chab.
124. C. DIVULSA Good., syn. *C. guestphalica* Boenn.
  C. Orsiniana Ten. est *divulsa* depauperata submonostachya.

Sect. 31. LAGOPINÆ Nym.

125. C. HELEONASTES Ehrh.
126. C. LAGOPINA Wahlbg.
  Var. *furva* Webb., forma capitata, culm. robust., humil.
  C. lagopina-fœtida, syn. *C. Laggeri* Wimm.
127. C. GLAREOSA Wahlbg.
128. C. HELVOLA Blytt. an *C. microstachya-canescens?* Boeckeler Linnea, 1875, p. 133.
129. C. MICROSTACHYA Ehrh.

Sect. 32. GLOMERATÆ Nym. p. p.

130. C. INCURVA Lightf.
  C. brevirostris Ced. est forma elongata.
  (Quid: *C. Deinbolliana* Gay, *C. arctica* Deinb.? a Boeckeler ad *C. stenophyllam* Wahlbg. ducta, Linnea., 1875, p. 51).
131. C. FŒTIDA All.
  Var. *elongata* spic. interrupt. elong.
132. C. MICROSTYLA Gay.
133. C. CURVULA All.
134. C. NARDINA Fries.

Sect. 33. PHYSODES.

135. C. PHYSODES M. Bieb. Ross. casp. ex Stev.

III. CEPHALOPHORÆ.

Sect. 34. SCHELLAMMERIA Moench.

136. C. CYPEROIDES L.
137. C. BALDENSIS L.

IV. MONOSTACHYÆ.

Sect. 35. PSYLLOPHORÆ Lois.

138. C. OBTUSATA Liljeblad non Garcke, etc. spec. sibir. et am. bor. occ. Europam in ins. Oeland et prope Lipsiam intrans.
139. C. RUPESTRIS All.
140. C. PYRENAICA Wahlbg.

Var. *Grossekii* Heuff. Banat. utric. stipitatis.
141. C. pauciflora Lightf.
142. C. microglochin Wahlbg.
143. C. pulicaris L.
144. C. macrostyla Lapeyr.
145. C. sagittifera Lowe, Ins. Mader.
Var. *Guthnickiana* Gay, Ins. Azor. minor.
145. C. gynocrates Wormskj. spec. bor. am. et Lappon.
147. C. dioica L.
C. dioica-echinata, syn. *C. Gaudiniana* Guthnick.
148. C. parallela Sommerfelt.
149. C. Davalliana Sm.
C. Davalliana-echinata, syn. *C. Paponii* Muret ined.

Sect. 36. Capitatæ.

150. C. capitata L.
151. C. scirpoidea Michx.
(Quid: *C. Gasparrinii* Parl.? an *C. oreophilæ* C.-A. Mey, caucasicæ affinis?).

NOTES ON THE FLORA OF CEYLON.

By Henry Trimen, M.B., F.L.S.

(Concluded from p. 245).

Amomum Benthamianum Trim.—Leaves lanceolate-linear, rather abruptly acuminate, smooth above, minutely puberulent beneath, sheaths and especially short rounded ligule rather densely covered with fulvous hairs; peduncle from the rootstock slender, short; spike capitate, very small, globose, dense; bracts ovate, acute, thin, nearly glabrous; flowers too imperfect in the specimen for examination; capsule ovoid, $\frac{3}{4}$ in. long, blunt, not ribbed, copiously echinate, with irregular short curved spines.

Hab. Reigam Korle, Sept. 1864 (C. P. 3864 in Hb. Perad.). This C. P. number is referred to by Bentham in 'Gen. Plant.,' iii., p. 645, under *Amomum* as "species crista lata lobis 2 rotundatis cum intermedio triangulari minore"; I regret that the only specimen in the Herbarium here does not allow me to examine the flowers, but the characters of the fruit seem to show the plant to be distinct.

This species comes near to *A. fulviceps* Thw., which has, however, much larger heads, densely golden-tomentose bracts, and the anther-crest is semilunar and slightly bifid.

Cyanotis arachnoidea Clarke, var. obtusa Trim. — Large; leaves of erect barren shoots numerous, densely placed, distichous, curved, bract-shaped but not keeled beneath, obtuse, subapiculate, glabrous or slightly floccose beneath and on the margins, bright rather glaucous green above, more or less purple beneath; flowering-shoots coming off from axils of former leaves on the rootstocks, long-trailing, stout and succulent, compressed below, afterwards cylindrical; leaves oblong, like those of barren shoot but smaller, all glabrous or nearly so, except at the nodes, which are slightly cobwebbed or silky-floccose; spikes sessile or shortly stalked, in clusters of 4 or 5 in axils of upper leaves; bracts falcate, acute, much imbricated, nearly glabrous outside, but with floccose hair round the flowers within; sepals ovate, acuminate, transparent, villous with delicate cottony hair; petals ovate-spathulate, obtuse, the broad claws coherent, the blades spreading, pale bright violet-blue; stamens equal, very much exserted, erect; upper half of filaments covered with long moniliform spreading blue hairs; apex dilated into a flask-shaped bulb with an attenuated point bearing the minute anther; ovary truncate, covered with erect silky hair; style precisely like the filaments of the stamens, and similarly terminated by a pointed bulb; seeds dark brown, the testa covered with very numerous minute prominences.

Hab. On hot exposed rocks at Doluwe Kande, Kurunegala, and other low hills. A rather striking plant, not devoid of beauty; the leaves of the barren shoots are 9–10 in. long by 1¼ in. wide, the flowering-branches trail to a great distance, and are usually entirely coloured an intense deep red-purple.

I had at first referred this to the widely-spread eastern species *C. barbata* Don, but afterwards named it *C. obtusa*, sp. nov. I am. however, informed by Mr. Hemsley that it agrees with *C. arachnoidea* Clarke, under which I here place it. I have no authentic specimen of that species, which Mr. Clarke (Mon. Phan. iii. 250) gives as a native of the Ceylon mountains as well as of Peninsular India. He also quotes for it Wight's figure of *C. pilosa* (Ic. t. 2083), which is very unlike my plant.* I have, however, kept it as a variety under *C. arachnoidea;* though from the type of this it differs considerably in its much larger size and much less wool, and in the filaments, like the style, being thickened at their summit into a bulk. The forms of this group are most difficult to limit satisfactorily.

Phœnix zeylanica Trim.—*Elate sylvestris* Linn. (pro maxima parte). *Phœnix sylvestris* Thw. (non Roxb.). — Stem erect, simple, rarely branched at the base, stout, reaching a height when full grown of 12, 14, or even more feet, but as usually seen much shorter, covered with the bases of the fallen leaves; leaves rather short, the pinnæ very numerous, not fasciculate, but nearly equally distant on the rachis, the lower ones reduced to strong sharp spines 3–3½ in. long, the rest lanceolate-linear, the largest 7–10 in. long, conduplicate, very sharp-pointed, smooth, bright and shining, deep green, thick, rigid, distinctly 4-ranked, the ranks spreading nearly at right-angles, those pointing downwards set on obliquely with a twist at the base; spathes sparingly covered with shaggy orange-coloured down. Female flowers:—Calyx somewhat truncate, half the length of the petals, strongly 3-toothed, not ribbed; petals rotundate, each with 2 staminal rudiments at the base; fruit ½–⅝ in. long, ovoid-oblong, apiculate, deep inky-purple when ripe, scarlet when half-ripe.

Hab. This is the common wild Date Palm or "Indi" of the south and west parts of Ceylon (C. P. 3172), and has long been

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* I sent living plants of this to Kew in Sept. 1883; these have flowered there, and I am now informed that Prof. Oliver considers that they may be a form of *C. arachnoidea* Clarke, but do not correspond precisely with anything in the Kew Herbarium.

considered the same as the common and well-known wild Date of India, *P. sylvestris* Roxb. It is, however, clearly distinguishable by its different habit, stouter trunk, shorter leaves, with more rigid, dark green, shining, non-fasciculate segments and black fruit. It is a common plant in Ceylon, but is not known in South India save in the Botanic Gardens. The fruit has a scanty pulp, which is scarcely edible. Linnæus's original *Elate sylvestris* (Sp. Plant. i. 1189) was mainly based on this plant (= Fl. Zeylanica, n. 397), but he also quotes Rheede, 'Hort. Malab.,' iii., tt. 22–25, which is probably the common Indian species. Whether the other Ceylon *Phœnix*, noted in a former part of this paper as *P. pusilla* Gaertn., is truly a distinct species may be open to doubt, but both it and *P. zeylanica* are quite different from the yellow-fruited *P. sylvestris* of India.*

I have been accustomed for some years to call our Palm *P. zeylanica*, and the name has also been published for it in the List of Palms cultivated at Kew, printed as an appendix to the Report of that establishment for 1882. Sir Joseph Hooker, who has made a careful study of the genus, is convinced of the distinctness of the Ceylon plant.

Calamus nivalis Thw. ms.—Leaf-sheaths armed with copious large, straight, flat, yellow prickles, passing on the rachis beneath and at the sides into distant, solitary, recurved ones; no terminal cirrhus; rachis raised above, smooth; segments numerous, closely placed, equidistant, broadly linear, tapering at both ends, with 3 principal nerves and other intermediate ones, with a few distant scattered setæ on the principal nerves beneath and at the apex; spadix slender, elongated, set with hooked thorns, extended into a terminal thorny lorum, slightly branched; flowering branchlets usually short, numerous but not crowded, more or less stiffly recurved; larger spathes prickly, smaller ones slightly so or smooth; bracts ciliate; male flowers crowded, with scanty fulvous scurf; calyx cut half-way down; petals and stamens raised on a stalk so that the former appear as long again as the calyx; female flowers larger and less crowded; corolla 3-toothed, fulvous-puberulous; fruit $\frac{5}{8}$ in. long, with a large point or beak, ovoid; scales small, pale yellow, not channelled, tipped, and narrowly bordered with reddish brown.

Hab. Pasdun Korle, Sept. 1864; Colombo, *W. Ferguson* (C. P. 3914 in Herb. Perad.). Not a large species. Leaves about 3 ft. long, the longest segments about 9 or 10 ins., bright pale yellow-green.

A near ally of *C. tenuis* Roxb., which differs in its general furfuraceous covering, smaller more distant and usually hermaphrodite flowers on shorter branchlets, and nearly globular fruit with larger scales. I am indebted to Mr. W. Ferguson for fresh specimens in flower, collected about five miles from Colombo by the Koti Canal.

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* The fruit of this is, when ripe, 1 in. long by $\frac{1}{2}$ in. wide, and of a dull purplish orange, having passed through in ripening a bright orange-chrome yellow; the pulp is more copious, with a sweet flavour quite similar to that of the cultivated date.

Calamus ovoideus Thw. ms. — Stem stout; leaf-sheaths densely set with many close rings of broad, flat, often lacerate, deflexed black prickles; rachis with deciduous down when young, concave above, the lateral ridges set with short sharp prickles, convex beneath, with distant solitary sharp reflexed spines, becoming more numerous on the petiole, extending into a long cirrhus set with numerous closely-placed semicirclets of stout hooks; leaflets equidistant, broadly linear, attenuate, many-nerved, the two principal ones (besides the midrib) with a few long weak setæ on the upper surface; apex bristly; spadix branched, the lower spathes with stout deflexed hooks, the smaller ones smooth; no lora; flowers not seen; fruit $\frac{5}{8}$–$\frac{3}{4}$ in. long, oblong-ovoid, beaked, tapering slightly at base, which is supported by the much enlarged persistent perianth; scales numerous, small, furrowed down the centre, pale greyish yellow, very narrowly edged with orange-brown.

Hab. Saffragam District, Western Prov., 1866. (C. P. 3925 in Hb. Perad.). Native name, "Tambutu-wel." A large species, a specimen of which is in the Botanic Garden; leaves 14 ft. long or more, of which 4 ft. is occupied by the long tendril; longest leaflets about 14 in. long, bright shining apple-green above, duller beneath.

Judging from the fruit only, this species appears to be near *C. acanthospathus* Griff. (Palm. Brit. Ind. p. 50, t. cxc. A, 1), from Khasya, but the foliage of that plant is not described.

Cryptocoryne Beckettii Thw. ms. — Petiole slender, from 1½–3 times as long as the blade, sheathing at base; blade lanceolate-oblong, the base cordate or subauriculate, the apex subacute, entire, undulated, glabrous, minutely dotted above, 5–7-nerved, texture thin; spathe sessile, small; tube narrow, straight, glabrous, striate, scarcely contracted above the inflorescence; blade small, not more than half as long as the tube, ending in a short tail; stalk of male inflorescence shorter than it; female flowers (carpels) 5; fruit not seen,

Hab. Matale East, Feb. 1865, *Mr. T. W. N. Beckett* (C. P. 3868 in Herb. Perad.). Rootstock small; petioles 4–8 in. long; leaf-blades 2½–4 in.; spathe sessile, not an inch long. In some specimens (? submerged) the leaves are larger and narrower than above described, and less cordate.

I have only herbarium specimens, and only one has an inflorescence, which is perhaps not fully matured. The species is apparently near *C. cordata* Griff. (Ic. t. 172), from which it differs in its narrower and differently-veined leaves, sessile inflorescence, and shorter spathe.

Lagenandra insignis Trim. — Leaves with long petioles, the blade oblong-oval, acute at both ends, especially at apex, glabrous above, closely dotted beneath; midrib beneath very thick and prominent, and with the numerous close lateral veins rough or woolly with short harsh scurfy hairs or papillæ; spathe very large, the tube short, funnel-shaped, the limb many times longer, expanded, thin in texture, crisped and undulated, suddenly narrowed into a short tail, the upper part falling over (like an *Arisæma*), glabrous, "purple with white veins"; inflorescence and fruit as in *L. toxicaria.*

Hab. By water, Palewatu-Mukelane, Pasdun Korle, May, 1883. Leaves 12 in. long by 4 in. wide; spathe fully 9 in. long. This was brought in by the native plant-collectors already half-dried; the spathes dyed the drying-paper deep purple. Roots were also brought for the garden, but have not yet flowered here.

Near the very common *L. toxicaria* Dalz. (= *Arum ovatum* L.), but very distinct by the large purple drooping spathe; the leaves are also well characterised by the peculiar indumentum of the veins beneath. This adds a fifth species to this genus, all of which are natives of Ceylon, and four of them endemic here.

Eriocaulon fluviatile Trim.—Submerged; rhizome creeping, slender, flexuous, ascending at the end, attaining several inches in length, and emitting copious long roots; leaves about 4 to 8, very long (8 to 10 in.), not closely inserted, very narrow (scarcely $\frac{1}{24}$ in. wide), solid, compressed (oval or section), channelled along one face, flaccid, dark green, shining, gradually dilated at base into a membranous sheath lined with a cottony wool; scape solitary, apparently terminal, rather shorter than the leaves, erect, stiff, slender, cylindrical; basal sheath about $\frac{1}{2}$ in. long, loose but not dilated, smooth, thin, split down one side from the top for a short distance, free portion acute; heads small (about $\frac{1}{4}$ in. diam.), depressed-globular; involucral scales short, roundish-oval, entire, very obtuse, smooth, brown, floral ones linear-oblong, with coarse white hairs on the upper part; flowers apparently diœcious, minute, densely crowded on the semiglobular receptacle; female flowers with sepals and petals spathulate-linear, the latter narrower, pellucid, with scanty white hairs at top; style deeply 3-cleft; seeds smooth, pale orange; male flowers not seen.

Hab. Plentiful in a quick-flowing stream (the Kappara-ela) now flowing into the reservoir at Labugama, West Prov., Jan. 1885; in company with Mr. W. Ferguson. The plant is entirely submerged in the rapid current, only the heads of flowers being elevated above the surface; it is abundant in the smaller tributaries, as well as the Kappara-ela main stream. Mr. Ferguson had previously sent me specimens of this curious species collected in or near the same place in 1882, on the occasion of the Elephant Kraal held there in that year. I also think that specimens in the Herbarium here (of leaves only) under C. P. 3057, labelled "Galle and Hewesse," may be the same plant.

The only Indian species which seems to be allied at all closely to this is *E. Dalzellii* Koern. (*E. rivulare* Dalz.), from Western India. But this, as described in Kew Journ. Bot. iii. p. 280, has the stem densely leafy, the leaves flat, 1 line broad, 7-nerved and much shorter, the scapes umbellate-congested and only twice as long as the leaves, and the involucral bracts lacerate.

Isachne australis R. Br., var. effusa Trim. — Differs from the type, as seen in Ceylon, in its larger size, much broader, more compound panicle 3–5 in. long, with the branches more horizontal and the flowers on longer pedicels, and quite glabrous glumes.

Hab. Streams about Peradeniya, Central Prov., flowering in January. The stems root at the lower nodes. A much more diffuse growing plant than the ordinary form of the species here.

The empty glumes are certainly not persistent below the articulations in this plant, but fall with the spikelet or immediately after, leaving the bare much-dilated apex of the pedicel very conapicuous, as in so many species of *Paniceæ*.

I. meneritana Poir. is merely *I. australis* type. The name was (Encycl. Method. Suppl. iii. 185) bestowed on the Ceylon plant mentioned by Brown when he published the genus *Isachne* as being a member of it (Prod. Fl. Nov. Holl. p. 196). The specimen is in Hermann's herbarium, and is alluded to by Linnæus in 'Flora Zeylanica' under No. 43. Mr. Ridley, of the British Museum, has kindly examined the original, and informs me that it is precisely C. P. 880 (i. e., *I. australis*). The Sinhalese name "Meneri-tana" (tana = grass) is, however, erroneously applied to this by Hermann; it rightly belongs to two species of *Panicum*—*P. miliare* and *P. psilopodium*—which are commonly cultivated as dry grains in the low country.

Panicum reticulatum Thw. ms. — A large, erect, perennial grass, 3–6 ft. or more in height; leaf-sheaths strongly hispid with bristly hairs; nodes silky; blade linear, rather long, somewhat hispid beneath near the base; ligule short, erect, jagged-ciliate; panicle very large and compound, the branches long, erect or ascending, the lower in tufts not verticillate, all flexuous and rough; spikelets rather scattered and distant, on slender pedicels, under $\frac{1}{8}$ in. long, acuminate, glabrous; outer glume subacute, not half the length of the spikelet, broad, 5-nerved, somewhat gibbous; 2nd and 3rd glumes subequal, very concave, apiculate, with a hard tip, 7–9-nerved, all three similar in texture, membranous, olive- or purplish-green, the parallel nerves connected mostly in the upper part by 2–4 short transverse ones forming a loose reticulation, the 3rd glume with a rather large empty membranous palea in its axil; flowering-glume not much shorter, smooth and shining; grain plano-convex, hard, smooth and polished, bright ochre-yellow.

Hab. Borders of paddy-fields, Hewessee, Pasdun Korle, Aug. 1865 (C. P. 3890 in Herb. Perad.); Culloden Estate, near Kalutara, 1881, *W. Ferguson*. A large handsome species, attaining a great size, and with very hispid sheaths when grown in a garden at Colombo. The arrangement of the spikelets and branching of the panicle is somewhat similar to those of the universally cultivated "Guinea Grass," *P. maximum* L., to which indeed the present species is allied.

I am informed by Mr. Hemsley that this species is also in Herb. Kew from Malacca (Griffith) and from the Philippines (Cuming 652 & 1667). The latter specimens are named by Bentham and Munro "*P. cæsium* Hk. & Arn. ex Nees"; but Mr. Hemsley points out that they are quite distinct from the Macao plant so named by Hk. & Arn. in Bot. Beechey's Voy. p. 235, which is clearly a species of the *Echinochloa* group. Steudel has copied their description (Syn. p. 47) under "*P. cæsium* Nees (in pt.)," and the locality given for this is "Ceylon." Under these circumstances I believe our plant to require a name, and I now leave it under Thwaites' very appropriate appellation, though in the list of additional C. P. numbers at the commencement of this paper I have given it as *P. cæsium* Nees.

Panicum blephariphyllum Trim. — Leaf-sheaths smooth or the upper ones with scattered spreading bristly hairs; ligule obsolete; blade broadly linear, gradually tapering to apex, broad semi-amplexicaul and auricled at the base, closely veined, thin, flat, glabrous on both sides, the margin furnished with long, fine, straight, spreading, stiff cilia from small bulbous bases; panicle long-stalked, 8–10 in. long; branches solitary or two together, scattered, ascending, rough, slightly branched, with a tuft of long hairs at base; spikelets stalked, solitary, about $\frac{1}{8}$ in. long; lowest glume more than three-fourths the length of the spikelet, strongly apiculate, broad, normally 3-nerved, the nerves strongly scabrous; 2nd glume acuminate-cuspidate, with central midrib and a pair of closely-placed nerves on either side, smooth; 3rd glume rather shorter, acute, similarly veined, with a male flower in axil; flowering-glume about half the length of 3rd, obtuse, thick.

Hab. Ruanwelle, Western Prov., Nov. 1883, *Mr. W. Ferguson.*

Very near *P. Leptochloa* Nees (C. P. 918), especially in the spikelets, which scarcely differ save in being rather longer and less crowded, and with somewhat broader glumes. Both belong to that group of *Panicum* in which the lowest glume approaches the others in length. *P. Leptochloa* is, however, a more slender grass; and its leaves are narrow and rigid, and not or but very slightly dilated at the base; nor have they the marked ciliation of the margin.

I notice that the lowest glume is very frequently 4-nerved, and then somewhat unsymmetrical.

Dimeria laxiuscula Thw. ms. — Perennial, tufted; stems erect, rather slender, 2–3 ft. high, scarcely branched; nodes with a thick tuft of white silky hair; leaf-sheaths smooth in lower, hairy in upper part; blade narrow, linear, erect, strongly keeled, more or less hairy on both sides, and long-ciliate on margin; ligule short, truncate; spikes 5–10, 3–4 in. long, slender; spikelets small, shortly stalked, each with a short tuft of silky hair at the base, much flattened; lowest glume linear, very acute, strongly conduplicate, with long cilia on the keel below; 2nd glume longer, almost aristate, with hyaline margins, glabrous but for a few long hairs on the back above; 3rd glume much shorter, hyaline and transparent; terminal glume hyaline, deeply bifid, and with a bent arm four times its length; stamens 2.

Hab. Pasdun Korle, Sept. 1864 (C. P. 3863 in Herb. Perad.); Kulutara, Dec. 1882.

Near *D. pilosissima* Trim. (*Haplachne* Presl). but with a stricter habit, narrower leaves, and smaller and laxer spikelets with a shorter tuft at the base; the glumes are much more compressed and glabrous, and the two lower more unequal. I have, however, recently found at Labugama a form of *D. pilosissima* (var. *glabra* Trim.) with the glumes quite as glabrous as those of *D. laxiuscula.*

The name of this species has already been published, without description, in W. Ferguson's 'Grasses of Ceylon,' in Journ. Roy. Asiatic Soc. (Ceylon Branch) for 1880, p. 38. M. Hackel agrees in considering it a distinct species.

Teinostachyum ? maculatum Trim. — Densely tufted; rhizome much and intricately branched, the short curved branches clothed with thin yellow or brown scales; culms closely placed, attaining about 25 ft. in height, slender, the largest seen about $\frac{5}{8}$ in. in diameter and many not half that size, stiff but not very strong, surrounded at base by a few papery sheaths; joints 15–20 in. long, smooth, polished and shining in the lower part, the upper part of each harsh with minute closely-adpressed silvery scurf-like hairs, greyish green, elegantly mottled with irregular rings, bands, lores, and blotches of dark purplish claret-colour, subpersistent; leaf sheaths ("spathes") 4 or 5 in. long, very closely adpressed to the stem, truncate, smooth, yellow; rudimentary leaf-blade linear, acuminate, deflexed; branchlets densely tufted; leaves lanceolate-oblong, 6–8 in. long by 1–$1\frac{1}{4}$ in. wide, very shortly petiolate, suddenly rounded at the base, unequal-sided, tapering into a long filiform apex, the margins rough with minute forward-pointing prickles, smooth on both surfaces, closely veined, with no cross-veinlets, bright apple-green above, purplish glaucous beneath; sheaths lax, striate, smooth, auricled at top, the auricles angular and provided with a few long filiform deciduous appendages; flowers not seen.

Hab. Forming jungle in several places in the districts of Ambagamua, Ruanwelle, and regions to the south-west of Adam's Peak. The specimens described were collected on Galbodde Tea Estate, Ambagamua, Dec. 1883, by Mr. C. J. Ferguson. A gregarious bamboo, the slender stems rising erect for 8 or 10 ft. and then commencing to droop, the straggling upper branches requiring support and becoming subscandent, as is the case with many other small bamboos, e. g., *Arundinaria debilis* and *Teinostachyum attenuatum*. In the absence of flowers and fruit it is of course impossible to refer this with good reasons to any established genus. The native name is "Rama Batali," the latter word being the name of the very common *Ochlandra stridula*, the small bamboo which covers hundreds of square miles of country in the south and west of Ceylon.

The history of the detection of this very pretty species here is rather curious. It resulted from the exhibition, at a show held by the Agri-horticultural Society of Colombo, in August, 1883, of some light furniture, boxes, &c., cased with the mottled stems split and varnished. I at once recognised these as distinct from any recorded species in Ceylon, and on enquiring of the native gentleman, Mr. P. de Saram, exhibiting them, was informed of its Sinhalese name, and that it was not uncommon on the southern slopes of the Adam's Peak Mountains. Mr. W. Ferguson afterwards learnt that it also grew near Ruanwelle, and on a visit thither in November was able to confirm the report. It has since been collected in other places in the same climatic district of Ceylon, and plants are now growing in the Botanic Gardens. It is indeed remarkable that so characteristic a bamboo, and one so well known to the natives, should have remained quite unnoticed by the numerous collectors and botanists who have been over the country during the past fifty years.

It is much to be hoped that flowering specimens may be obtained, as it may not improbably form a new genus of *Bambuseæ*.

Trichomanes Wallii Thw. ms. — Fronds simple, ¼ to nearly ⅜ in. long, mostly broad-ovate, with a cordate base and very obtuse apex; margin minutely and distantly denticulate; venation subradiate, the midrib being distinct, but lost before reaching the apex of the frond; no spurious venules; involucres solitary, terminal, not placed in a sinus, and not or very slightly exserted beyond the margin of the frond; border of mouth flat, spreading, entire.

Hab. Stones and tree-trunks in the stream running through the Labugama Elephant Kraal, March, 1870, collected with masses of *T. muscoides* by Mr. W. Ferguson (C. P. 3989 in Herb. Perad.). Rhizome very slender; fronds not crowded, subsessile.

Very near *T. Motleyi* V. de B., and perhaps not more than a variety of it, but distinguishable by the sunken not exserted involucres. The shape of the fronds varies; the ones bearing fruit are less cordate, or even tapering at the base.

The name *T. Wallii* Thw. has been published in Mr. W. Ferguson's pamphlet, 'Ceylon Ferns' (Colombo, 1880), preface, and in Mr. G. Wall's 'Check List.' It is not mentioned in Col. Beddome's 'Handbook' (1883).

PLANTS OF EAST GLOUCESTER AND NORTH WILTS.

By G. C. Druce, F.L.S.

In July last I made a special search for *Carex tomentosa* in the water meadows of Marston Measey, but without success. The following additions to the Flora of N. Wilts (Vice-county 7), as given in 'Topographical Botany,' ed. ii., were met with. A few are inserted from E. Gloucester (33), from near Kingham:—

Ranunculus Drouetii F. Sz. Near Lechlade (33). — *R. fluitans* Lam. Thames near Marston Measey (7).

Nymphæa alba L. Thames above Kelmscott (33).

Polygala vulgaris L. Canal-side, Marston (7); also near Kempsford (33).

Sagina apetala L. Marston Massey (7); Lechlade (33).

Rosa mollis Sm. Marsh Hill (7); between Kelmscott and Lechlade (33).

Callitriche obtusangula Le Gal. Marston (7); Lechlade (33).

Cotyledon Umbilicus L. Fairford (33).

Œnanthe Lachenalii Gmel. Canal-side near Lechlade (33). — *Œ. fluviatilis* Colem. River above Lechlade (33).

Rosa urbica. Marston (7); Lechlade (33).

Rubus rhamnifolius W., *R. rudis* W., *R. thyrsoideus* W., and *R. corylifolius* Sm. Oddington (33).

Potentilla procumbens Sibth. Oddington (33).

Epilobium obscurum Schreb. Near Foscott (33).

Valeriana sambucifolia Mill. Near Foscott (33).

Carduus pratensis L. Meadow near Kempsford (33).

Orchis incarnata L. With above (33).

Alisma ranunculoides L. Not infrequent in canal, extending also into N. Wilts (33).

Potamogeton flabellatus Bab. (*P. junceus* K.). River Thames in Gloucester and North Wilts (7, 33); and with *P. lucens*, the common pond-weed, from Eynsham westward to Marston. — *P. compressus* Schrad. (*P. Friesii*). Canal from Marston to its juncture with the Colne (7, 33).—*P. natans* L. With above (7, 33).

Scirpus acicularis L. Growing on mud at bottom of canal, in a barren state, extending into Gloucester (7). — *S. pauciflorus* L. Meadow at Marston, with *S. caricinus* (*Blysmus*), &c. (7).

Carex flava L. With above (7); and also in a marsh just in Gloucester, typical *flava* (7, 33).

Glyceria plicata Fr. Fairford (33); Marston Measey (7).

Festuca Pseudo-Myurus L. Walls of Lechlade (33).—*F. elatior* L. Meadows, Marston (7).

Bromus commutatus Schr. Meadows, Marston (7).

Equisetum limosum L. River near Lechlade (33).

Chara hispida L. Canal between Marston and Lechlade, in both counties (7, 33). — *C. vulgaris* L. With above (7, 33).

A meadow at Marston showed *Blysmus compressus* as one of the commonest ingredients in its vegetation, *Iris acoriformis* is the common *Iris* of the Upper Thames, and, judging from immature specimens, *neglectum* is the common *Sparganium*. *Bromus racemosus* is a frequent meadow-grass.

Rosa mollis is common above Bampton, in Oxon, and stretches into both Wilts and Gloucester, as above stated. On the stiff Oxford Clay at Bampton *R. canina* seemed very variable, as it does on Otmoor, in Oxon, and as there the *Rubi* were almost confined to *R. discolor* and *R. corylifolius*.

A *Festuca* form from Marston and Lechlade, and also from Oxon, is worth further study; it is the same form as the one gathered on Brean Down by Dillenius, and referred to in the 'Richardson Correspondence.'

A SYNOPSIS OF THE CAPE SPECIES OF *KNIPHOFIA*.

By J. G. Baker, F.R.S.

Kniphofia Mœnch.

Perianth cylindrical or infundibuliform; tube long; segments subequal, small, ovate or oblong, obtuse. *Stamens* 6, hypogynous, as long as the perianth or longer, the three opposite the inner segments longest; filaments filiform, slightly declinate; anthers oblong, dorsifixed, versatile, dehiscing introrsely. *Ovary* sessile, 3-celled; ovules few or many, superposed; style long, filiform; stigma subentire, minute, capitate. *Capsule* subglobose, coriaceous, loculicidally 3-valved. *Seeds* triquetrous, acutely angled; testa thin, brown-black, punctate; albumen fleshy. Rootstock neither bulbous nor tuberous. Leaves all radical, persistent, linear or ensiform, narrowed very gradually to the apex. Peduncle long, naked. Flowers numerous, generally bright red or yellow, arranged in a subspicate raceme; pedicels short, articulated at the apex, shorter than the white scariose persistent bracts.

Hab. Also several species in Abyssinia and the Equatorial Mountains, and one in Madagascar.

Pedicels very short.
- Perianth $\frac{1}{6}$–$\frac{1}{3}$ in. long.
  - Perianth subcylindrical. Stamens and style but little exserted.
    - Perianth $\frac{1}{6}$ in. long . . . . 1. *K. Buchanani.*
    - Perianth $\frac{1}{4}$ in. long . . . . 2. *K. breviflora.*
    - Perianth $\frac{1}{3}$ in. long . . . . 3. *K. parviflora.*
  - Perianth infundibuliform. Style and stamens much exserted . . . 4. *K. infundibularis.*
- Perianth $\frac{1}{4}$–$\frac{3}{4}$ in. long.
  - Leaves linear.
    - Perianth $\frac{1}{3}$ in. diam. low down . . 5. *K. gracilis.*
    - Perianth 1-12th in. diam. low down . 6. *K. pumila.*
  - Leaves ensiform-acuminate . . . 7. *K. ensifolia.*
- Perianth 1–1$\frac{1}{4}$ in. long.
  - Leaves subtriquetrous, very narrow . 8. *K. triangularis.*
  - Leaves linear.
    - Leaves 1$\frac{1}{2}$–2 ft. long.
      - Raceme moderately dense; flowers all yellow . . . . . 9. *K. natalensis.*
      - Raceme very dense; most of the flowers bright red . . . 10. *K. Macowani.*
      - Raceme dense; flowers purplish-yellow . . . . . 11. *K. porphyrantha.*
    - Leaves 3–4 ft. long . . . . 12. *K. laxiflora.*
  - Leaves ensiform.
    - Stamens and style much exserted . 13. *K. sarmentosa.*
    - Stamens and style but little exserted.
      - Leaf $\frac{3}{4}$–1 in. broad low down . . 14. *K. aloides.*
      - Leaf 1$\frac{1}{4}$–1$\frac{1}{2}$ in. broad low down . 15. *K. Rooperi.*

Pedicels $\frac{1}{6}$–$\frac{1}{4}$ in. long.
- Acaulescent.
  - Raceme lax . . . . . 16. *K. pauciflora.*
  - Raceme dense . . . . . 17. *K. Burchellii.*
- Caulescent . . . . . . 18. *K. caulescens.*

1. **K. Buchanani** Baker. — Old leaves splitting up into fibres. Leaves linear, moderately firm in texture, 2–3 ft. long, $\frac{1}{8}$–$\frac{1}{6}$ in.

broad, with about 5 veins between the midrib and thickened smooth margin. Peduncle shorter than the leaves. Raceme dense, 2–3 in. long, ½ in. diam.; pedicels very short; bracts ovate-lanceolate, acute, ⅛ in. long. Flowers all pale yellow; perianth subcylindrical, ⅙ in. long, 1-12th in. diam. at the throat; segments semiorbicular, ½ lin. long. Stamens and style about as long as the perianth.

Hab. Natal, *Rev. J. Buchanan*!

2. K. BREVIFLORA Harv. MSS.; Baker in Journ. Linn. Soc. xi. 361.—Leaves linear, not rigid, 1–1½ ft. long, 1-12th in. broad near the base, with about 5 strong ribs and a thickened scabrous margin, Peduncle slender, terete, 1½ ft. long. Raceme dense, 1–1½ in. long; pedicels very short; bracts ovate-lanceolate, acute, ⅓–⅙ in. long. Flowers pale yellow; perianth cylindrical, ¼ in. long; throat 1-12th to 1-8th in. diam.; segments ovate, obtuse, ½ lin. long. Stamens as long as the perianth or slightly exserted. Ovules 4–6 in a cell.

Hab. Orange Free State, *Cooper* 1029! 3294!

3. K. PARVIFLORA Kunth Enum. iv. 553. — Leaves linear, rigid in texture, ⅙ in. broad at the middle, flat, smooth on the margin. Peduncle slender, terete, as long as the leaves. Raceme dense, about 3 in. long; pedicels very short; bracts ovate, acute, ⅛ in. long. Perianth cylindrical, ⅓ in. long; segments ovate, obtuse. Stamens and style slightly exserted. Ovules 4–5 in all.—Baker in Journ. Linn. Soc. xi. 361.

Hab. Kaffraria; hills between Omsamwubo and Omsamcaba, alt. 1000–2000 ft., *Drege* 4528.

4. **K. infundibularis** Baker.—Leaves linear, not rigid or thick in texture, ⅙ in. broad, with a smooth margin and 4–5 veins on each side of the midrib. Peduncle short, slender. Raceme dense, 2–3 in. long, under 1 in. diam.; pedicels very short; bracts lanceolate, acute, ⅙ in. long. Flowers all yellow. Perianth infundibuliform, ⅓ in. long, 1-12th in. diam. at the base, 1-12th in. at the throat; segments ovate, obtuse, as long as broad. Stamens and style exserted, ¼ in. long beyond the tip of the segments.

Hab. Southern Provinces. Described from a specimen, cultivated at Kew, in the herbarium of Bishop Goodenough.

5. K. GRACILIS Harv. MSS.; Baker in Journ. Linn. Soc. xi. 362. —Leaves linear, 1½–2 ft. long, ⅙ in. broad, with 5–6 veins between the midrib and smooth margin. Peduncle as long as the leaves. Raceme dense, 2½–3 in. long; pedicels very short; bracts ovate, obtuse, ⅛–⅙ in. long. Perianth whitish, ½–⅝ in. long; tube very slender, ⅓ lin. diam.; throat dilated; segments oblong-spathulate, 1-12th in. long. Style and longer stamens exserted.

Hab. Zulu-land, *Gerrard & McKen* 2140!

6. K. PUMILA Kunth Enum. iv. 552. — Leaves linear, 1½–2 ft. long, ½ in. broad low down, tapering gradually to the apex, moderately firm in texture, with a smooth margin and 10–12 veins on each side of the midrib. Peduncle moderately stout, as long as the leaves. Raceme dense, 4–6 in. long; pedicels very short; bracts oblong-lanceolate, acute, ⅓ in. long. Perianth infundibuliform, ⅝–¾ in. long, 1-12th in. diam. at the base, ⅙ in. at the throat;

segments ovate, obtuse, as long as broad. Style and stamens half as long again as the perianth. Capsule globose, $\frac{1}{6}$ in. diam.—Baker in Journ. Linn. Soc. xi. 552. *Veltheimia pumila* Willd. Sp. Plant. ii. 182. *Aletris pumila* Ait. Hort. Kew. i. 464. *Tritoma pumila* Gawl. in Bot. Mag. t. 764. *Tritomanthe pumila* Link. Enum. i. 33; Roem. et Schultes Syst. vii. 631.

Hab. Central and Southern Provinces, northward as far as Colesberg and Bechuana-land, *Burchell* 2554! *Shaw*!

7. **K. ensifolia** Baker. — Leaves ensiform, very acuminate, moderately firm in texture, 3 ft. long, 1–1$\frac{1}{4}$ in. broad at the base, tapering very gradually to the apex; veins numerous, fine, immersed; margin smooth. Peduncle moderately stout. Raceme dense, 3 in. long; pedicels very short; bracts ovate-oblong, $\frac{1}{4}$–$\frac{1}{3}$ in. long. Flowers all yellow. Perianth infundibuliform, $\frac{5}{8}$–$\frac{3}{4}$ in. long, $\frac{1}{8}$ in. diam. at the base, $\frac{1}{4}$ in. at the throat; segments ovate, obtuse, nearly 1-12th in. long. Style exserted $\frac{1}{2}$ in. beyond the tip of the segments.

Hab. Matebe River, Transvaal, *Holub* 1530!

8. K. TRIANGULARIS Kunth Enum. iv. 551.—Old leaves splitting into fine fibres. Leaves rather rigid, erect, subtriquetrous, about a foot long, 1-16th to 1-12th in. broad, with 2 veins between the midrib and margin. Peduncle slender, terete, 1–1$\frac{1}{2}$ ft. long. Raceme dense, 1–1$\frac{1}{2}$ in. long; pedicels very short; bracts oblong-lanceolate, acute, $\frac{1}{4}$–$\frac{1}{3}$ in. long. Flowers all yellow, Perianth cylindrical, $\frac{3}{4}$–1 in. long, 1-12th in. diam. at the throat; segments ovate-oblong, obtuse, longer than broad. Stamens and style included.—Baker in Journ. Linn. Soc. xi. 362.

Hab. Central Province, on the Witbergen, alt. 6000--7000 ft., *Drege* 3524!

9. **K. natalensis** Baker.—Leaves linear, 1$\frac{1}{2}$–2 ft. long, $\frac{1}{4}$–$\frac{1}{3}$ in. broad, firm in texture, with about 10–12 veins on each side of the midrib, smooth on the thickened margin. Peduncle 2–3 ft. long, $\frac{1}{4}$–$\frac{1}{3}$ in. diam. Raceme moderately dense, 6–8 in. long; pedicels very short; bracts ovate or ovate-oblong, acute or obtuse, $\frac{1}{6}$–$\frac{1}{4}$ in. long. Flowers all yellow; perianth subcylindrical, $\frac{7}{8}$–1 in. long, $\frac{1}{2}$ line thick above the ovary, $\frac{1}{8}$ in. at the throat; segments ovate, 1-12th in. long. Style sometimes exserted.

Hab. Inanda, Natal, *Wood* 636! An imperfect specimen from Cooper 3265 may be the same species, but it has a much more exserted style.

10. K. MACOWANI Baker in Journ. Bot. 1874, 3. — Old leaves splitting into long fibres. Leaves linear, rigid, erect, 1$\frac{1}{2}$–2 ft. long, $\frac{1}{8}$–$\frac{1}{6}$ in. broad, with 3–5 strongly marked veins on each side of the midrib, and a thickened denticulate margin. Peduncle slender, 1$\frac{1}{2}$–2 ft. long. Raceme dense, 2–4 in. long; pedicels very short; bracts ovate-lanceolate, acute, $\frac{1}{6}$–$\frac{1}{4}$ in. long. Many upper flowers bright red, lower yellow. Perianth cylindrical, about an inch long, $\frac{1}{8}$ in. diam. both at the middle and throat; segments spreading, ovate, obtuse, 1-12th in. long. Style finally sometimes slightly exserted.—Bot. Mag. t. 6167; Carrière in Rev. Hort. 1879, 390, with coloured figure. *Tritoma rigidissima* and *maroccana* Hort.

Var. β *longiflora* Baker.—Bracts more obtuse. Perianth 1¼ in. long; segments ovate-oblong, ⅙ in. long.

Hab. Grassy places on the Boschberg, alt. 4500 ft. *Macowan* 1536! β, summit of the Tandjesberg, Graaf Reinet, alt. 5000 ft. *Bolus* 761! *K. corallina* Hort., raised by Deleuil of Marseilles, is a hybrid between *K. Macowani* and *K. aloides*.

11. K. PORPHYRANTHA Baker in Journ. Bot. 1874, 4. — Old leaves splitting up into fine fibres. Leaves linear, moderately firm in texture, 1½ ft. long, ¼–⅓ in. broad, with a smooth margin, a stout midrib, and 10–12 veins on each side of it. Peduncle as long as the leaves. Raceme dense, 2 in. long; pedicels very short; bracts oblong-lanceolate, acute, ¼–⅓ in. long. Flowers pale yellow or tinged with purple, all much deflexed. Perianth cylindrical, 1–1¼ in. long, ⅙ in. diam.; segments ovate, obtuse, as long as broad. Stamens and style not exserted.

Hab. Orange Free State, *Cooper* 3207! 3208!

12. K. LAXIFLORA Kunth Enum. iv. 552.—Leaves linear, flat, rigid, 3–4 ft. or more long, ⅓ in. broad at the middle, scabrous on the margin. Peduncle terete. Raceme lax, 6–8 in. long; pedicels very short; bracts ovate, obtuse, ¼–⅓ in. long. Perianth cylindrical, 14 lines long; segments ovate, obtuse. Stamens a little shorter than the perianth. Ovules about 10 in a cell.

Hab. Natal, between Omtendo and Omsamculo, *Drège* 4527. A plant presented to Kew alive by Miss Nash, and another sent from Nottingham, Natal, by the Rev. J. Buchanan, differ from Kunth's type by their lanceolate acute bracts.

13. K. SARMENTOSA Kunth Enum. iv. 552.—Leaves thin, ensiform, acuminate, 2–3 ft. long, ¾–1 in. broad, with about 12 fine veins on each side of the midrib, glaucous-green, the margin almost smooth and not much thickened. Peduncle as long as the leaves, ½ in. thick in the cultivated plant. Raceme dense, cylindrical, ½–1 ft. long; pedicels very short; bracts ovate-lanceolate, ⅓–½ in. long. Upper flowers red, lower yellow; perianth cylindrical, ⅞–1 in. long, ⅛ in. thick above the ovary, ⅙ in. at the throat; segments ovate, obtuse, 1-12th in. long. Longer stamens and style exserted, ⅓–½ in. Ovules 10–12 in a cell.—Baker in Journ. Linn. Soc. xi. 362. *Aletris sarmentosa* Andr. Bot. Rep. t. 54. *Veltheimia sarmentosa* Willd. Enum. 380. *V. repens* Andr. Bot. Rep. xviii. 63. *V. media* Donn. Hort. Cantab. edit. xi. 131. *Tritoma media* Gawl in Bot. Mag. t. 744; Red. Lil. t. 161; Ait. Hort. Kew. edit. 2, ii. 290. *Tritomanthe media* Link. Enum. i. 334; Rœm. et Schultes, Syst. vii. 630.

Hab. Southern provinces.

14. K. ALOIDES Mœnch. Meth. 631. — Leaves ensiform-acuminate, 2–3 ft. long, ½–¾ in. broad low down, moderately firm in texture, slightly glaucous, scabrous on the margin, with 30–40 close vertical veins. Peduncle as long as the leaves, ⅓–½ in. diam., low down. Raceme dense, often ½ ft. long; pedicels 1-12th–1-8th in. long; bracts ovate, obtuse, ¼ in. long. Upper flowers bright scarlet, lower yellow. Perianth cylindrical, 1¼ in. long, ⅙ in diam. at the throat; segments ovate, obtuse, 1-12th in. long and broad.

Style, and sometimes also the stamens, exserted in the lower flowers. Ovules 12–15 in a cell. Capsule ovoid, $\frac{1}{4}$ in. long and broad.—Kunth Enum. iv. 551; Flore des Serres, t. 1393; Baker in Journ. Linn. Soc. xi. 364. *K. Uvaria* Hook. in Bot. Mag. t. 4816. *Aloe uvaria* Linn. Sp. Plant. 460. *Aletris uvaria* Linn. Mant. 308. *Tritoma uvaria* Gawl in Bot. Mag. t. 758; Red. Lil. t. 291. *Veltheimia uvaria* Willd. Sp. ii. 182; Jacq. Fragm. vii. t. 4, fig. 9. *V. speciosa* Roth, Nov. Sp. 490.

Var. *maxima* Baker in Bot. Mag. t. 6553.—Taller than the type, with leaves 4–5 ft. long, 1 in. broad at the base. Raceme longer. Flowers larger.—*Tritoma grandiflora*, Hal. *K. præcox* Baker in Saund. Ref. Bot. t. 168. *Tritoma Saundersii* Carrière in Rev. Hort. 1882, 504, with coloured figure.

Var. *nobilis* Baker.—A still more robust form, with peduncle, including the 1–1$\frac{1}{2}$ ft. raceme, sometimes 6–7 ft. long. Flowers 1$\frac{1}{2}$ in. long, and leaves 1$\frac{1}{2}$ in. broad at the base.—*Tritoma nobilis* Guillon in Rev. Hort. 1882, 24; 1885, 252 (coloured figure).

Hab. Throughout the Colony, from the southern provinces to Natal, ascending to 6000–7000 ft. on the Sneewbergen range. *Thunberg*! *Drège*! *Cooper* 3324! *Macowan* 1908! *Bolus* 217! *Wood* 1330! *K. præcox* is a form that at first flowered with Mr. Wilson Saunders in May, but afterwards changed to September. Another garden variety is *K. carnosa* Hort., in which nearly all the flowers are bright red. Another form, which I have received under the name of *K. Sandersoni*, has bright green leaves like *Burchellii*.

15. K. Rooperi Lemaire Jard. Fleur. t. 362.—Leaves ensiform, 3 ft. long, 1$\frac{1}{4}$–1$\frac{1}{2}$ in. broad low down, dull green, tapering very gradually to the apex, moderately firm in texture, scabrous on the margin, with about 50 distinct vertical veins. Peduncle shorter than the leaves, $\frac{1}{2}$ in. diam. low down. Raceme dense, often $\frac{1}{2}$ ft. long; pedicels very short; bracts ovate, obtuse, $\frac{1}{6}$–$\frac{1}{4}$ in. long. Upper flowers bright red, lower bright yellow. Perianth cylindrical, 1$\frac{1}{4}$–1$\frac{1}{2}$ in. long, $\frac{1}{6}$ in. diam.; segments ovate, obtuse, as long as broad. Style, and sometimes the longer stamens finally, exserted. Ovules 12–15 in a cell.—Baker in Journ. Linn. Soc. xi. 363; Bot. Mag. t. 6116. *Tritoma Rooperi*, Moore in Gard. Comp. 1, 113, with figures.

Hab. Natal and Kaffraria, *Hort. Kew*! *Hort. Leichtlin*! *Hort. Saunders*! Flowers in November and December in English gardens. Scarcely more than a variety of *K. aloides*.

16. **K. pauciflora** Baker.—Leaves few, linear, firm in texture, 1–1$\frac{1}{2}$ ft. long, $\frac{1}{8}$–$\frac{1}{6}$ in. broad, with 8–15 ribs and a thickened smooth margin. Peduncle slender, terete, 1$\frac{1}{2}$–2 ft. long. Raceme lax, 2–4 in. long; pedicels $\frac{1}{8}$–$\frac{1}{6}$ in. long; bracts lanceolate, acute, $\frac{1}{6}$ in. long. Flowers all yellow; perianth between cylindrical and infundibuliform, $\frac{5}{8}$–$\frac{3}{4}$ in. long, 1-12th in. diam. above the ovary, $\frac{1}{8}$–$\frac{1}{6}$ in. at the throat; segments ovate, obtuse, as long as broad. Style a little exserted, and sometimes also the longer stamens. Ovary globose.

Hab. Natal, *Sanderson* 416! Inanda, *Wood* 1096!

17. K. Burchellii Kunth Enum. iv. 552.—Leaves ensiform,

bright green, moderately firm in texture, 2–3 ft. long, ½–¾ in. broad low down, tapering very gradually to the apex, smooth on the margin, with 15–20 close veins on each side of the midrib. Peduncle as long as the leaves, ⅓ in. diam. low down. Raceme moderately dense, 3–4 in. long; pedicels ⅙–¼ in. long; bracts oblong, obtuse, about as long as the pedicels. Upper flowers bright red, lower bright yellow. Perianth cylindrical, 1¼–1½ in. long, ⅛ in. diam.; segments ovate, obtuse, 1-12th in. long. Style finally exserted; stamens included; ovules 10–12 in a cell.—Baker in Journ. Linn. Soc. xi. 393, excl. syn. *Tritoma Burchellii* Herbert in Bot. Reg. t. 1745.

Hab. Southern provinces, *Thunberg*! *Burchell*! The plant grown for many years under this name at Kew has a peduncle spotted with purple, and much shorter pedicels than Burchell's type, and connects it with *K. Uvaria.*

18. K. CAULESCENS Baker; Hook. fil. in Bot. Mag. t. 5946.—Caulescent, with a stem ½–1 ft. long, as thick as a man's thumb. Leaves ensiform, acuminate, 2–3 ft. long, 2–3 in. broad at the base, moderately firm in texture, very glaucous, with 40–50 very distinct ribs, acutely keeled, the margin conspicuously denticulate. Peduncle as long as the leaves. Raceme dense, 4–6 in. long, 2–2½ in. diam.; pedicels ¼ in. long; bracts oblong-lanceolate, ¼ in. long. Perianth an inch long, ⅛ in. diam. above the ovary, ⅙ in. at the throat; segments ovate, obtuse, 1-12th in. long and broad. Stamens and style all much exserted,

Hab. Province of Albany, on the Stormbergen Mountains. Introduced by Mr. T. Cooper into cultivation about 1860. Painted by Miss North from a plant procured near Grahamstown now in cultivation in the Cactus-house at Kew.

A CLASSIFICATION OF GARDEN ROSES.

By J. G. Baker, F.R.S.*

A GOOD general monograph of the genus *Rosa* is needed. Lindley's 'Monograph' was published in the year 1820, and since then a great number of new species have been discovered, and a very large number of books and papers have been written bearing upon the subject in one way or another. The difficulty which one finds at the outset in using Lindley's book is that his primary groups are characterised so briefly, and that the points of contrast which they present are not fully and clearly brought out into view. The following key shows the best way of getting over these difficulties which, after having had a large number of specimens through my hands during the last thirty years, I am able to suggest. The list of species is only intended to be exhaustive so far as garden roses are concerned, with the addition of a few well-marked types not yet brought into cultivation. What I have aimed at is to give a separate number to well-marked types only, and to place under these the subspecies and varieties into which they deviate. Of course I am well aware that in *Rosa*, of all genera, even if independent observers work from the same standing-point, it is not in the least likely that any two of them will draw the line between species and subspecies in the same way. What follows must therefore be taken as a rough draft of a very condensed guide to the determination and classification of the garden types.

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* From the 'Gardeners' Chronicle,' August 15th, 1885, p. 199.

Analytical Key to the Groups.

Leaf simple, exstipulate . . . . . 1. *Simplicifoliæ.*
Leaf compound, stipulate.
  Styles forming a column, protruded beyond the disc . . . . . . 2. *Systylæ.*
  Styles not united nor protruded beyond the disc.
    Stipules nearly free, deciduous . . 3. *Banksianæ.*
    Stipules adnate above the middle, persistent.

Diacanthæ.—*Main prickles in pairs at the base of the leaves.*

Fruit persistently pilose . . . . . 4. *Bracteatæ.*
Fruit glabrous . . . . . . 5. *Cinnamomeæ.*

Heteracanthæ.—*Prickles scattered, numerous, passing gradually into aciculi and setæ.*

Leaves not rugose; large prickles long and slender . . . . 6. *Pimpinellifoliæ.*
Leaves rugose, coriaceous; large prickles short and stout . . . . 7. *Centifoliæ.*

Homoecanthæ.—*Prickles scattered, comparatively few, subequal.*

Prickles slender; leaf not glandular below . 8. *Villosæ.*
Prickles stout and hooked; leaf not glandular below . . . . 9. *Caninæ.*
Leaves very glandular beneath . . . 10. *Rubiginosæ.*

Classified Enumeration of the Garden Species and Subspecies.

Group I. Simplicifoliæ.

1. R. SIMPLICIFOLIA Salisb. (= *R. berberifolia* Pallas = *Lowea berberifolia* Lindl. = *Hultheimia berberifolia* Dumont).—Siberia and Persia.

R. Hardii Paxt.—A hybrid between *berberifolia* and *laxa.*

Group II. Systylæ.

2. R. REPENS Scop. (*R. arvensis* Huds.).—Europe.
   capreolata Neill (the Ayrshire Rose).
3. R. SEMPERVIRENS Linn.—South Europe and India.
   prostrata DC.
   scandens Miller.
   Leschenaultiana Thory & Redouté.
   longicuspis Bertol.

4. R. MOSCHATA Miller.—Southern Europe and India.
Dupontii Desegl. (*nivea* Dupont).
Brunonii Lindl.

5. R. MULTIFLORA Thunb.—China & Japan.
polyantha Siebold (*Luciæ* Franch. & Rocheb.).

6. R. ABYSSINICA R. Br. (*Schimperiana* Hochst. & Steud.).—Abyssinia.

8. R. PHŒNICEA Boiss.—Orient.

9. R. SETIGERA Michx. (*rubifolia* R. Br.), the Prairie Rose.—United States.

10. R. STYLOSA Desv. (*collina* E. B.).—Europe.
leucochroa Desv.
systyla Bast.

Connects Groups II. and IX.

Group III. BANKSIANÆ.

11. R. BANKSIÆ R. Br. (*inermis* Roxb.).—China.
lutea Lindl. Bot. Reg. t. 1105.

12. R. MICROCARPA Lindl. (*amoyensis* Hance).—China.

13. R. FORTUNEANA Lindl. in Paxt. Flow. Gard. t. 171.—China.

14. R. SINICA Murr. (*lævigata* Mich.; *ternata* Poir.; *triphylla* Roxb.; *nivea* DC.; *cherokensis* Donn.).—China.
hystrix Lindl. Mon. t. 17.

Group IV. BRACTEATÆ.

15. R. BRACTEATA Wendl. (the Macartney Rose).—China.

16. R. INVOLUCRATA Roxb. (*Lyellii* Lindl.; *palustris* Hamilt.).—India.

Group V. CINNAMOMEÆ.

In some of these there are only the pairs of prickles at the base of the leaves, but in several of the species there are few or many aciculi in addition. These latter form a connecting link between Groups V. and VI.

17. R. CINNAMOMEA Linn.—Europe and North Asia.
majalis Retz.
davurica Pallas.

18. R. CAROLINA Linn. (*corymbosa* Ehrh.; *pennsylvanica* Mich.; *Hudsoniana* Red.).—North America.

19. R. LUCIDA Ehrh. (*baltica* Roth.; *Rapa* Bosc.).—North America.

20. R. HUMILIS Marsh (*parviflora* Ehrh.).—North America.

21. R. NITIDA Willd.—North America.

22. R. LAXA Retz. (*clinophylla* Red.).—Siberia.

23. R. WOODSII Lindl. (*Maximiliani* Nees). — North America, west side.
californica C. & S.
pisocarpa A. Gray.
Fendleri Crépin.

24. R. NUTKANA Presl.—North-west America.

25. R. GYMNOCARPA Nutt.—North America.

26. R. ANSERINÆFOLIA Boiss.—Orient.

27. R. FEDTSCHENKOANA Regel.—Central Asia.

28. R. RUGOSA Thunb. (*ferox* Lawr.; *Regeliana* André).—Japan and Siberia.

kamschatica Vent.

29. R. SERICEA Lindl.—India.

30. R. MICROPHYLLA Lindl.—China. Connects the *Cinnamomeæ* and *Bracteatæ*.

R. Iwara Siebold.—Supposed to be a hybrid between *rugosa* and *multiflora*.

Group VI. PIMPINELLIFOLIÆ.

31. R. SPINOSISSIMA L. (*pimpinellifolia* L.; *scotica* Miller).—Europe and Siberia.

altaica Willd. (*grandiflora* Lindl.).
myriacantha DC.

32. R. WEBBIANA Wall.—Himalayas.

33. R. PLATYACANTHA Schrenk.—Central Asia.

34. R. RUBELLA Smith.—Europe.

stricta Donn.
gentilis Sternb.
reversa W. & K.

These perhaps hybrids between *spinosissima* and *alpina*.

35. R. HIBERNICA Sm.—Ireland and England. Perhaps a hybrid between *spinosissima* and *canina*.

36. R. INVOLUTA Sm.—Europe, principally Britain.

Sabini Woods.
gracilis Woods.
Wilsoni Borrer.

37. R. MACROPHYLLA Lindl.—India.

38. R. ALPINA L. (*inermis* Mill.).—Europe.

pendulina L.

39. R. BLANDA Ait.—North America.

fraxinifolia Borkh.
arkansana Porter.

40. R. ACICULARIS Lindl.—North Temperate Zone.

carelica Fries.
Sayi Schwein.

41. R. HEMISPHÆRICA Herm. (*glaucophylla* Ehrh.; *sulphurea* Alt.; *Rapini* Boiss.).—Orient.

42. R. HISPIDA Sims (*lutescens* Pursh.).—Garden origin.

Group VII. CENTIFOLIÆ.

43. R. GALLICA L. (*austriaca* Crantz.).—Europe and Western Asia.

pumila L. fil.
incarnata Miller.
provincialis Miller.

44. R. CENTIFOLIA Miller.—Orient.

muscosa Miller.
pomponia DC.
parvifolia Ehrh. (*burgundica* Rossig.; *remensis* Desf.).

45\. R. DAMASCENA Miller (*bifera* Pers.).—Orient.
belgica Miller.
portlandica Hort.
calendarum Mœnch.
variegata Andrews.

46\. R. TURBINATA Ait. (*francofurtensis* Desf.; *campanulata* Ehrh.).—Garden origin, perhaps hybrid between *gallica* and *canina*.

R. hybrida Schleich. and *R. arvensis* Krock., probably hybrids between *gallica* and *arvensis*.

Group VIII. VILLOSÆ.

47\. R. VILLOSA Linn. (*mollis* Smith.; *mollissima* Fries).— North Europe. Numerous varieties.
pomifera Herm.

48\. R. ORIENTALIS Dupont.—Orient.

49\. R. TOMENTOSA Smith.—Europe. Numerous varieties.
fœtida Bast.
scabriuscula Smith.

50\. R. SPINULIFOLIA Dematra.—Switzerland.

51\. R. HACKELIANA Tratt.—South Europe.

Group IX. CANINÆ.

52\. R. CANINA Linn.—Europe. Orient. Varieties innumerable; 150 are treated as species, with full synonymy, in Déséglise's 'Catalogue of the Roses of Europe and Asia.' One series of forms has erect subpersistent sepals, and another leaves slightly glandular beneath.

53\. R. ALBA L. — Garden origin, perhaps a hybrid between *canina* and *gallica*.

54\. R. RUBRIFOLIA Vill.—Europe.

55\. R. MONTANA Chaix (*Reynieri* Hall. fil.).—Central Europe.

56\. R. INDICA L. (*chinensis* Jacq.).— Native country not clearly known.
fragrans Red. (*odoratissima* Sweet).
semperflorens Curt. (*diversifolia* Vent.; *bengalensis* Pers.).
longifolia Willd.
caryophpllea Red.
minima Curt. (*Lawrenceana* Sweet).
anemonæflora Hort.

R. Noisetteana Seringe and *R. Ternauxiana* Ser. are supposed to be hybrids between *indica* and *moschata*; *R. borbonica* Red. between *indica* and *gallica*; *R. reclinata* Red. (Borsault Rose) between *indica* and *alpina*; *R. ruga* Lindl. between *indica*, *fragrans*, and *arvensis*; and *R. Fortuneana* Lemaire, Jard. Fleur. t. 361, is doubtless also a hybrid, of which *indica* is one of the parents.

Group X. RUBIGINOSÆ.

57\. R. RUBIGINOSA L. (*Eglanteria* Miller; *suaveolens* Pursh.).—Europe.

58\. R. MICRANTHA Smith.—Europe.

59. R. sepium Thuill.—Europe. Numerous varieties.
agrestis Savi.
inodora Fries (*Klukii* Besser).
60. R. ferox M. B.—North Asia.
61. R. glutinosa S. & S. (*pulverulenta* M. B.—Orient.
62. R. lutea Miller (*Eglanteria* L.).—Orient.
punicea Miller.

NEW CHINESE PLANTS.

By W. Botting Hemsley, A.L.S.

A small parcel of dried plants received at Kew from Mr. Ford, of the Botanic Garden, Hongkong, contains the following apparently undescribed species, besides others of great interest:—

Ceropegia trichantha Hemsl., n. sp. — Glaberrima, caulibus gracilibus volubilibus; foliis petiolatis subcarnosis ovato-lanceolatis 1½–2½ poll. longis acute acuminatis; pedunculis paucifloris foliis brevioribus vel æquantibus, pedicellis filiformibus floribus brevioribus; floribus angustis leviter curvatis 1½ poll. longis; calycis lobis subulatis; corollæ lobis arcuatis tubo æquilongis e basi lanceolata filiformibus, sursum denuo latioribus, apice cohærentibus, intus primum pilis sparsis longis candidis instructis; coronæ lobis sparse ciliatis, ligulis linearibus erectis, ovario glabro; folliculis tenuibus divaricatis, 4–5 poll. longis, circiter 2 lineas latis, seminibus subclavatis concavo-convexis.

Cape d'Aguilar, *Ford.*

Aristolochia (Diplolobus) **Fordiana** Hemsl., n. sp. — Affinis *A. Tagalæ*, ramulis gracilibus volubilibus glabris; foliis petiolatis tenuibus cordato-ovatis, sinu profundo, longe acuminatis acutissimis cum petiolo usque ad 5 poll. longis minute reticulato venosis 5–7-nerviis supra glabris subtus puberulis; floribus parvis (vix 1 poll. longis) glabris axillaribus solitariis (an semper?) pedunculatis; perianthio valde inæqualiter 2-labiato, labio majore ovato-oblongo tubo paullo longiore, fauce nuda; columna brevi glabra; antheris 6 brevibus.

Taimo Mountain, opposite Hongkong, *A. B. Westland.*

Aristolochia Westlandi Hemsl., n. sp. — Habitu ramulis foliisque *A. longifoliæ* simillima, sed foliis undulatis basi sæpius distincte auriculatis supra nitidis, floribus plusquam duplo majoribus, perianthio peltiformi reticulato-venoso extus sericeo villoso ferrugineo, tubo ?, limbo circumscriptione cordiformi ecaudato usque ad 6 poll. diametro, fauce annulata glabra; columna brevi, ut videtur 6-lobata; antheris 6 columna fere æquantibus.

Taimo Mountain, opposite Hongkong, *A. B. Westland.*

The foliage of this is so like that of *A. longifolia* that, without flowers, one might regard it as a variety; but the flowers are nearly three times as large, and appear to be very different in shape, having a relatively shorter tube. The flowers, however, are too much crushed to make out the shape of the tubular portion of the perianth of the present species.

Podocarpus insignis Hemsl., n. sp.—Foliis oppositis subsessilibus coriaceis, nec crassis, lineari-lanceolatis 1½–3 poll. longis obtusis vel acutis, supra læte viridibus et nervo longitudinali prominente, subtus juxta carinam crassam utrinque fascia glauca vel albida notatis; amentis masculis subterminalibus vel lateralibus solitariis vel binis breviter pedunculatis gracilibus, ut videtur pendulis, 2–2½ poll. longis; antheris peltatis vel semipeltatis 3–5 locularibus in fasciculos (vel columnas) dissitos secus rhachim gracilem dispositis; amentis femineis ignotis.

Taimo Mountain, opposite Hongkong, *A. B. Westland.*

This is a very distinct and remarkable species, if correctly referred to *Podocarpus;* but it may be a different genus. It has opposite leaves, similar in size and shape to those of *P. neriifolia*, and loose male catkins with lateral clusters of 3–5-celled anthers.

NOTICES OF BOOKS.

We are glad to see that the 12th part, concluding the 4th volume, of the 'Flora of British India' has been issued. The work is now brought down to *Amarantaceæ.*

The Third Annual Report of the Felsted (Essex) School Natural Science Society contains a list of additions to the flora of the neighbourhood, bringing the number of flowering plants up to about 560.

A local flora for a penny is before us in a pamphlet of eight pages, entitled 'Wild Flowers of Barmouth found in bloom July 31st to Aug. 16th, 1884, by F. W. Himing & Rev. G. S. Brewer (Barmouth, Kynoch). There are no grasses, sedges, or cryptogams; 259 "flowers and species" are given.

New Books. — F. Ardissone, 'La Vegetazione terrestre considerata nei suoi rapporti col clima' (8vo, pp. xxiv. 190: Milan, Dumolard: 6 lire). —A. Weissmann, 'Die Continuität des Keimplasma's als Grundlage einer Theorie der Vererbung' (8vo, pp. vi. 122: Jena, Fischer).—J. H. Oyster, 'Catalogue of Phænogamous and Vascular Cryptogamous Plants of N. America' (8vo, pp. i. 112: Paola, Kansas). — A. B. Hervey, 'A Guide for the Microscopical Investigation of Vegetable Substances: from the German of J. W. Behrens' (8vo, pp. xv. 466, tt. 2, 152 cuts: Boston, Cassino).— C. S. Dolley, 'The Technology of Bacteria Investigation' (8vo, pp. xii. 263: Boston, Cassino). — C. Artigalas & G. Maurange, 'Les Microbes Pathogènes,' fasc. i. (8vo, pp. ii. 260, tt. vi: Paris, Masson). — F. C. Schübeler, 'Norges Væxtrige et bidrag til Nordeuropas Natur-og culturhistorie,' pt. i. (4to, pp. 400, 4 maps: Christiania, Fabricius). — A. Millardet, 'Histoire des principales variétés et espèces de Vignes d'origine americaine qui résistent au Phylloxera' 4to, pp. xxxvi. 240, tt. 24: Paris, Masson).

ARTICLES IN JOURNALS.

American Naturalist. — Lester F. Ward, 'Evolution in the Vegetable Kingdom.'—S. A. Crozier, 'Branching of *Pteris aquilina.*' C. E. Bessey, 'Attempted Hybridization between Pond-scums of different Genera.'

Ann. & Mag. Nat. Hist. — R. Kidston, 'Relationship of *Ulodendron* to *Lepidodendron; Bothrodendron; Sigillaria;* and *Rhytidodendron*' (2 plates).

Botanical Gazette. — L. H. Bailey, 'Notes on *Carex*' (1 plate). —Autobiography of A. Fendler (contd).

Bot. Zeitung (July 31, Aug. 7).—A. Meyer, 'Ueber die Assimilationsproducte der Laubblätter angiospermer Pflanzen.' — (Aug. 14, 21). H. von Solms-Laubach, 'Die Geschlechter differenzirung bei den Feigenbaümen.' — F. G. Kohl, 'Zur Wasserleitungsfrage.'

Bull. Soc. Bot. Belge (Aug. 4). — E. Pâque, 'Flore Cryptogamique de la Belgique.'— E. Marchal, 'Champignons coprophiles de Belgique' (4 plates). — J. C. Lecoyer, 'Monographie des Thalictrum.'

Bull. Torrey Bot. Club (June). — W. R. Gerard, 'Notes on Generic Names.' — T. Meehan, 'Use of Spines in Cactuses.' — Id., 'Fertilisation in *Arenaria serpyllifolia.*'

Flora (July 21, Aug. 1, 11).—C. Müller, 'Bryologia Fuegiana.'

Gardeners' Chronicle (Aug. 8). — *Malvastrum Gilliesii* Baker; *Oncidium caloglossum* Rchb. f., n. sp. — 'David Douglas' (portrait). —W. B. Grove, 'Abnormal form of *Puccinia Betonicæ*' (fig. 38).— (Aug. 22). *Dendrobium pardalinum* Rchb. f., n. sp.; *Chlorophytum rhizomatosum* Baker, n. sp. — N. E. Brown, 'Terrestial Orchids of S. Africa' (*Corycium, Cymbidium, Disa, Disperis*). — C. T. Druery, 'Proliferous Fern' (fig. 52). — W. G. Smith, '*Puccinia Graminis*' (fig. 53). — (Aug. 29). *Eria lineoligera* Rchb. f., *Selenipedium Kaiteurum* N. E. Br., spp. nn. — W. G. Smith, '*Penicillium crustaceum Fr.*' (figs. 56–59).—*Athrotaxis cupressoides* (fig. 60).

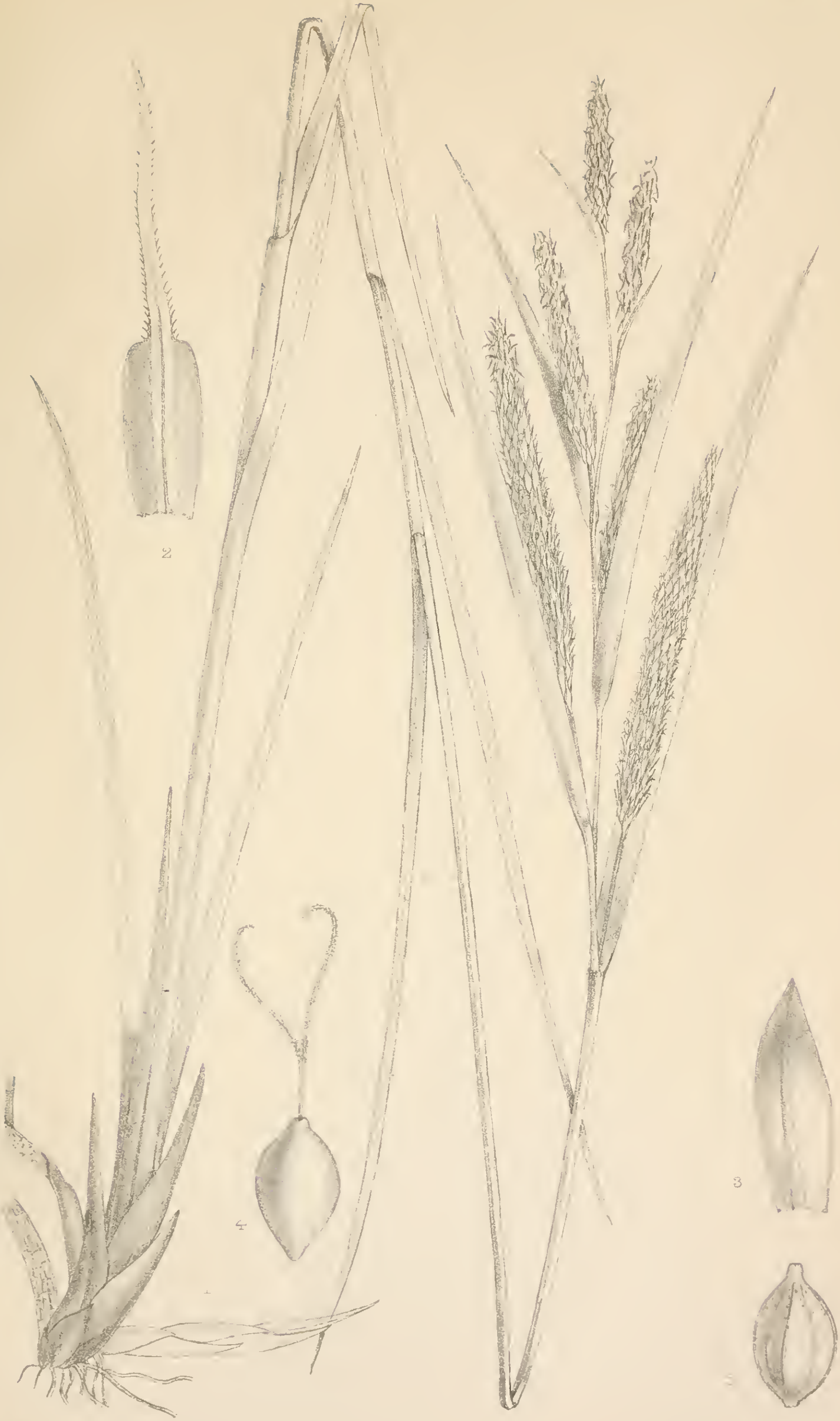
Journ. Linn. Soc. (xxi. No. 138). — (Aug. 26). H. Groves, 'Coast Flora of Japygia, S. Italy.' — H. O. Forbes, 'Contrivances for securing self-fertilization in some Tropical Orchids' (2 plates).— W. Mitten, 'Notes on European and N. American species of *Fissidens.*' — R. Kidston, 'Occurrence of *Lycopodites Vanuxemi* in Britain' (1 plate). — D. H. Scott, 'Occurrence of articulated laticiferous vessels in *Hevea*' (4 cuts).

Journ. Royal Microscopical Soc. — F. R. Cheshire & W. W. Cheyne, 'Pathogenic History and history under cultivation of *Bacillus alvei*, n. sp. ("Foul Brood" of hives' (2 plates).

Magyar Növénytani Lapok (June, July). — F. Mentovich, 'A bél néhány Kúszó növénynél.'

Pharmaceutical Journal (Aug. 22). — C. J. H. Wanden & L. A. Waddel, 'Madar' (*Calotropis*).

Tab. 262

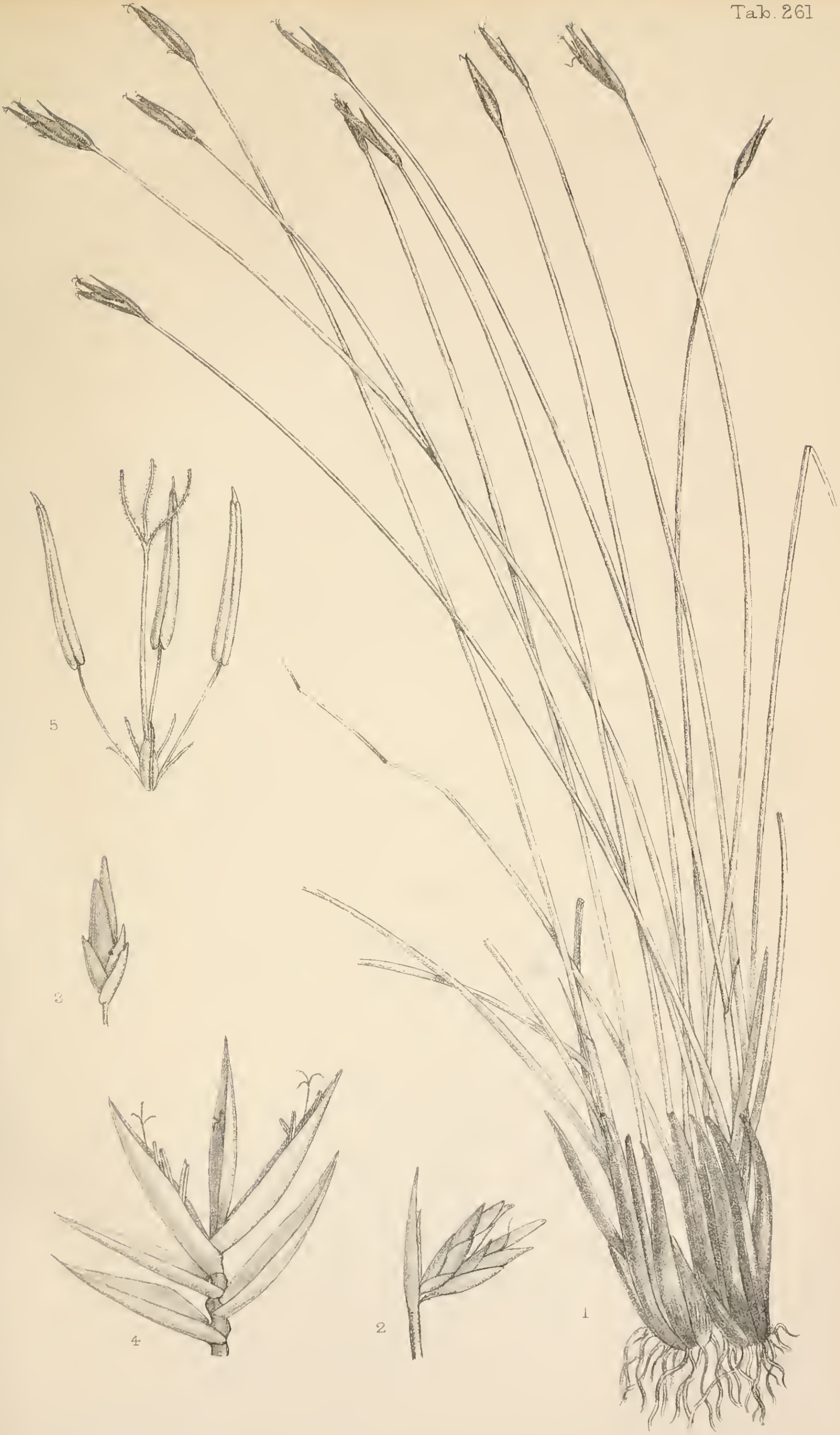


Robt. Morgan del. et lith.

West Newman & Co imp.

Carex salina *Wahl.*, *var.* kattegatensis, *Fr.*

Tab. 261



Robᵗ Morgan del et lith.
West Newman & Co imp

Schœnus ferrugineus, *L.*

TWO NEW BRITISH PLANTS.

By H. N. Ridley, M.A., F.L.S.

(Plates 261, 262.)

The persevering efforts of our British botanists in the North have again been rewarded by the discovery of two species of *Cyperaceæ* not hitherto recognised as belonging to our flora. These are *Schœnus ferrugineus* L., obtained by Mr. James Brebner in Perthshire, and *Carex salina* var. *kattegatensis* Fries, found by Mr. J. Grant in Caithness.

Of the genus *Schœnus* only two species occur in the North Temperate Zone, viz., *S. nigricans* L. and *S. ferrugineus* L., the bulk of the species, upwards of sixty in number, being natives of Australia and New Zealand. The first-named species has the widest range of any in the genus, extending from Sinai to Western North America, and occurring also in the Cape of Good Hope. *Schœnus ferrugineus* is of a much more limited distribution, being entirely confined to Europe, and by no means universally distributed even there. It is found, however, sparingly over the whole continent from Scandinavia to South Russia, excluding the extreme north and south, being apparently absent from the Spanish Peninsula, Italy, and France, with the exception of the Jura. Its habitat, like that of the other species, seems to be open peaty moors, often, especially in Southern Europe, at a considerable altitude.

Schœnus ferrugineus Linn. Sp. Pl. ed. i. p. 43; Vahl. Enum. ii. 207; Host, Gram. Austr. t. 71; Flora Danica, t. 1503; Anders. tab. i. fig. 3; Lange, Danske Flor. p. 36; Sturm, Deutschl. Flor. vol. x.; Blytt. Norges Flor. p. 259. — *Chætospora ferruginea* Rchb. Flor. Germ. p. 74, fig. 676; Boeckeler, Cyperac. Berl. Herb. 876.

Cæspitose; leaves sheathing the bases of the stems; sheaths ½–1 in. long, dark brown at base, polished, deeply cleft; lamina short, subulate, acute; stems numerous, strict, wiry, grooved, ½–1 ft. high, glaucescent; spikelets 2 or 3 in a head, subtended by a bract about equal to them in length; bract erect, oblong-mucronate; mucro long, terete, acute; spikelets lanceolate-acute, flattened, nearly ½ in. long, dark purple-brown, polished; glumes 5–6, dark blackish red, oblong-lanceolate, subacute; lower ones submucronate, empty; 3 upper ones containing flowers; stamens 3; filaments slender, persistent; bristles short, scabrid, 3–6; style trifid; stigmas short; fruit very small, elliptical, triangular; angles blunt.

Loc. — Scotland, Loch Tummel, Perth, *Brebner*! Norway. Sweden, Gotland, *Ahlberg*! *Nyman*! Benestad, *Ringius*! (Fries Herb. Norm.). Oeland, and as far north as Vesterbotten. Denmark, "Bidstrupgaard Sielland, *H. Bang*. Moen. Bornsholm," *fide* Lange in Dansk. Flor. Russia, *Cardis*! *Dorpat*! Baltic Provinces, *Gruner*. Oranienbaum, Ingria, *Meinetshausen*! (Fl. Ingr. No. 478 *b*). "Livonia, *Bunge*, Curonia, Fleisch. & Lindem. Lithuania, *Besser*," Ledeb. in Fl. Ross. iv. p. 260. Germany, Leipzig, *Richter*! (Rchb. Fl. Exsicc. No. 205). Füssen, Bavaria, *Andrae*! Bromberg, *Baenitz*! France, Vallée de Joux, Jura, *Ducommun*! Switzerland, Seedorf, Berne, *Seringe*! (Gram. Exsic. No. 56). Schoren, Thun, *R. J. Shuttleworth*! Pra-brunet, Lautaret, at 2000 metres, *Ozanon*! (Billot, Exsic. No. 2556). Austro-Hungary, Windisch-Garten, *Schultz*! (Herb. Norm. 167). Gfies, Tyrol, *Huter*! Moos-brunn, Vienna, *Woloszczak*! (Flor. Exsic. Austro-Hung. No. 1051). Glaneck, Salzburg, *Hoppe*! (Cent. iii.). Botzen, *Hausmann*! Thrace, Banja, *Frivaldsky* (*fide* Grisebach).

CAREX SALINA Wahlenberg.—This is a peculiarly interesting addition to our flora, on account of its distribution. The whole of the section to which it belongs, the *Maritimæ* of Nyman, are plants very characteristic of Arctic sea-shores, descending a little further south here and there along the coasts or on the mountains in the colder parts of Europe and North America. *C. salina* Wahl. is perhaps the commonest of the section, and is a very variable plant, on account of which it has received a very extensive synonymy. Boott. (Illustr. Car. iv. 160) classified the varieties and divided them into the tall typical form, and the variety *minor*, including all the smaller forms with narrower and slenderer leaves and culms, and fewer often sessile spikelets; but he remarks that the two varieties pass gradually into each other. Besides varying in these points, there is great variation in the length and scabridity of the mucro in the female glumes, whence arose Wahlenberg's vars. *cuspidata* and *mutica;* also in the number of stigmas, some specimens having two and some three, and in the colour of the glumes. In the very reduced forms, *subspathacea*, *reducta*, &c., the glumes are quite pale-coloured, as is often the case in high Arctic glumaceous plants; while in some of the taller forms from further south, *e. g.*, Massachusetts, the southern parts of Scandinavia, and the Caithness locality, the glumes are very dark in colour, forming the varieties *hæmatolepis*, *kattegatensis*, &c.

CAREX SALINA Wahlenberg, Act. Holm. 1803, 164; Flora Lapp. 246; Willd. 301; Schkuhr, fig. 185; Kunth Enum. p. 416; Fries Mantissa, 3, 145; Summ. Veget. 231; Anderss. Fl. Scand. 49, t. 5, fig. 50; Flor. Ross. p. 313; Boott. Ill. Car. iv. 160, t. 525; Boeckeler Cyp. Berl. Herb. p. 1377; Nyman Sveriges Fanerog. ii. 730; Steudel Syn. Glum. ii. 214.

C. cuspidata Wahlenb. Act. Holm. 1803, 164. — *C. recta* Boott. Hook. Fl. Bor. Am. p. 220, t. 222.—*C. hæmatolepis* Drej. Rev. Car. 44. — *C. halophila* Nyl.; Fries Summ. Veget. 231; Anderss. Fl. Scand. 48, t. 5, fig. 51. — *C. kattegatensis* Fr. — *C. ambusta* Boott. Ill. i. 64, t. 172. — *C. arctophila* Nyl. Spicil. Fl. Fen. iii. 14. — *C.*. *flavicans* Nyl. *l. c.* p. 15. — *C. bicolor* Nyl., non All. — *C. salinoides* Beurl. Syll. 398.

Var. MINOR Boott. Illustr. iv. t. 525–530.

Plant subcæspitose, stoloniferous, 12–18 in. high; leaves narrow, erect, acuminate, equalling the culms in length, about $\frac{3}{8}$ in. across, keeled; keel and margins scabrid; culms erect, rather stiff, triangular, striate; bracts leafy, acuminate, longer than the spikes;

spikes usually erect, lower ones sometimes nodding; 3 or 4 lower ones female with a few male flowers at the apex, 1½–2½ in. long, on short exsert peduncles; male spikes sessile, 2 or 3, about an inch long; glumes of female spikes ovate, obtuse (var. *mutica*), or mucronate (var. *cuspidata*); mucro in lower glumes long and very scabrid; glumes light brown, more rarely deep red-brown to nearly black (var. *hæmatolepis, kattegatensis*); keel and mucro green; male glumes ovate, oblong, obtuse, light brown, often with scarious edges; utricle a little shorter than the glumes, flattened, lenticular, obscurely many-nerved, with a short conical blunt perforate beak, yellowish when ripe, usually dotted with red; margins blunt, commonly minutely scabrid; stigma bifid or trifid, short, cleft to the beak of the utricle; caryopsis lenticular, ovate, narrowed at base, transversely grooved.

C. lanceolata Dew. Silliman's Journ. 29, p. 249. — *C. reducta* Drej. Rev. p. 36. — *C. Hoppneri* Boott, Ill.; Hook. Fl. Bor. Am. ii. 219, t. 220. — *C. subspathacea* Wormskiold Flor. Dan. t. 1530; Drej. Rev. 34; Fries Mantiss. 3, 148; Summ. Veget. 231; Anderss. Fl. Scand. 50, t. 5, fig. 49; Lange, *l. c.*, 74; Kunze Suppl. 98, t. 24; Flora Ross. 304. — *C. bracteata* Gieseke (*fide* Boott.) — *C. discolor* Nyland. Spic. Fl. Fin. iii. p. 12; Anderss. 54, t. 2, fig. 38; Flora Ross. — *C. epigeios* Fries Summ. Veget. 233.

Smaller; leaves narrower, culm more slender, 3–6 in. tall: spikes fewer, shorter, sometimes very reduced, with very few flowers, pale-coloured; utricles elliptical.

Loc.—Scotland, Caithness, sand-banks along the River Wick, *J. Grant*! Scandinavia, Varanger Fiord, *Fries*! Sommerfelt, Christiania, *Blytt*! Uleaborg, *Nylander*! (Fries Herb. Norm. 77). Nordland, *Wahlenberg*; Tana, *Lund*! Mouth of River Ponoj, *Fellman* (Pl. Arct. 274). Hisingen, Bohus, *Fries*! (var. *hæmatolepis*). Litsi, East Lapland, *Nylander*! Faroe Islands. Russia, Kola, *Fellmann*. Iceland, Norotunga, *Groenlund*. Spitzbergen, Kamschatka. North America, Maine, *S. Goodale* (*fide* A. Gray). East Massachusetts, *Morong*! Hood's Canal, Soquamish-country, *Tolmie*. Kotzebue's Sound, *Beechey*. Labrador, Hudson's Bay, &c.

Var. *minor*. — With the preceding. Scandinavia, Bodo, Nordland, *Arnell*! Kantalahti, East Lapland, *Fellmann*! (Pl. Arct. No. 275). North America, California, swamps near Mendocino City, *Bolander* 4702! Greenland, *Vahl*! Hudson's Bay, Cumberland House. Labrador.

Explanation of Plates.

Plate 261. — *Schœnus ferrugineus* Linn. Fig. 1. Whole plant, two-thirds nat. size. 2. A capitulum, enlarged. 3. A spikelet. 4. The same opened. 5. A flower.

Plate 262. — *Carex salina* var. *kattegatensis*. Fig. 1. A complete plant, reduced. 2. Glume from the lower part of a female spike, enlarged. 3. Glume from upper part. 4. Female flower. 5. Ripe utricle.

A SYNOPSIS OF THE GENUS *SELAGINELLA*.

By J. G. Baker, F.R.S., &c.

(Concluded from p. 252).

297. **S. perpusilla**, n. sp. — Stems suberect, very slender, under an inch long, sparingly pinnate, the upper branches simple, the lower sometimes forked. Leaves of the lower plane erecto-patent and contiguous on the branchlets, spaced and spreading on the main stem, oblique oblong, acute, $\frac{1}{2}$ lin. long, bright green, membranous, rather unequal-sided, broadly rounded, serrulate, and slightly imbricated over the stem on the upper side at the base; leaves of the upper plane half as long, ovate-cuspidate. Spikes very short, resupinate, $\frac{1}{8}$–$\frac{1}{6}$ in. diam.; bracts of the upper plane lanceolate, erecto-patent, green; of the lower plane pale, ascending, ovate-cuspidate.

Hab. Nyika country, East Tropical Africa, *Rev. T. Wakefield*!

298. S. TENERRIMA A. Br. in Kuhn Fil. Afric. 193.—Stems very slender, suberect, flexuose, $1\frac{1}{2}$–2 in. long, sometimes forked at the base, copiously pinnate, the lower branches considerably compound. Leaves of the lower plane spaced even on the branchlets, the upper erecto-patent, the lower patent, oblong-lanceolate, acute, $\frac{1}{2}$ lin. long, pale green, membranous, rather unequal-sided, denticulate and slightly rounded on the upper side at the base, hardly at all imbricated over the stem; leaves of the upper plane half as long, oblong, with a large cusp. Spikes very short, resupinate, $\frac{1}{8}$ in. diam.; bracts of the upper plane lanceolate, rather squarrose; of the lower plane pale, ascending, ovate-lanceolate, acuminate.

Hab. Golungo Alto Angola, in woods by the side of streams, *Welwitsch* 45!

299. S. SUBCORDATA A. Br. in Kuhn Fil. Afric. 193. — Stems very slender, suberect, sometimes forked at the base, $1\frac{1}{2}$–2 in. long, copiously pinnate, the lower branches with several short patent branchlets. Leaves of the lower plane crowded on the branchlets, spaced and patent on the main stem, oblique ovate, acute, $\frac{1}{2}$ lin. long, membranous but rather rigid, shortly ciliated on the upper margin, very cordate, and much imbricated over the stem on the upper side at the base; leaves of the upper plane half as long, ovate-cuspidate. Spikes not seen.

Hab. Sierra Leone, on shaded rocks in the woods at Freetown, *Welwitsch* 3!

300. S. UNILATERALIS Spring Mon. ii. 254.—Stems 3–6 in. long, erect from a decumbent base, closely pinnate, the lower branches scarcely an inch long, but considerably compound. Leaves of the lower plane very crowded, ovate-oblong, acute, above a line long, rigid, pellucid, bright green, slightly falcate, conspicuously ciliated on the upper edge; those of the upper plane very small, suborbicular, cuspidate. Spikes $\frac{1}{6}$–$\frac{1}{4}$ in. long, resupinate; bracts of the upper plane ovate-oblong, subobtuse; of the lower plane ovate or suborbicular, cuspidate.

Hab. Madagascar, *Bernier*.

301. **S. madagascariensis**, n. sp. — Stems erect, pale straw-coloured, ½–1 ft. long, copiously pinnate, the lower branches with numerous compound branchlets. Leaves of the lower plane spaced even on the branchlets, erecto-patent; those of the stem spreading, oblong-lanceolate, acute, pale green, membranous, a line long, very unequal-sided, broadly rounded, serrulate, and slightly imbricated over the stem on the upper side at the base; leaves of the upper plane half to one-third as long, ovate-lanceolate, cuspidate. Spikes short, copious, resupinate, 1 lin. diam.; bracts of the upper plane ovate-lanceolate, erecto-patent; of the lower plane pale, ovate-cuspidate, ascending.

Hab. Madagascar, near Antananarivo, *Pool*! *Miss Helen Gilpin*! Closely allied to *S. chrysocaulon* of the Himalayas.

302. **S. Melleri**, n. sp.— Stems erect, ½ ft. long, copiously pinnate, the erecto-patent branches copiously compound. Leaves of the lower plane contiguous and erecto-patent on the branchlets, much spaced and spreading on the main stem, oblique oblong, acute, pale green, membranous, ½–¾ lin. long, more rigid in texture than in *S. madagascariensis*, not so unequal-sided, serrulate all down the upper edge, broadly rounded, and imbricated over the stem on the upper side at the base; leaves of the upper plane small, ovate-cuspidate. Spikes short, resupinate, 1 lin. diam.; bracts of the upper plane oblong-rhomboid, obtuse, erecto-patent; of the lower plane ascending, ovate-cuspidate.

Hab. Madagascar, on mountainous paths at Inbatomanga, *Dr. Meller*! Tanala, *Kitching*!

303. S. MOLLICEPS Spring Mon. ii. 257.—*S. rubricaulis* A. Br. in Kuhn Fil. Afr. 211.—*S. Hildebrandtii* A. Br.—Stems erect, densely tufted, 6–9 in. long, copiously pinnate, the face bisulcate, the lower branches copiously compound. Leaves of the lower plane contiguous on the branchlets, spaced on the main stem, erecto-patent, oblique oblong-lanceolate, acute, dark green, membranous, 1 lin. long, very unequal-sided, serrulate on the upper edge, broadly rounded, shortly ciliated, and a little imbricated over the stem on the upper side at the base; leaves of the upper plane half to one-third as long, ovate or ovate-lanceolate, cuspidate. Spikes copious, resupinate, ¼–½ in. long, 1 lin. diam.; bracts of the upper plane erecto-patent, lanceolate-rhomboid; of the lower plane ovate-cuspidate, ascending.

Hab. Upper Guinea, *Curror*! *Barter*! Angola, *Welwitsch*! Manganja Hills, alt. 3000 ft., *Dr. Kirk*! Madagascar, *Lyall*! Johanna Island, 1000–2500 ft., *Hildebrandt* 1807! *Dr. Meller*!

304. **S. simplex**, n. sp. — Stems very slender, erect, simple, ¼–⅓ in. long. Leaves of the lower plane spaced, spreading, broad oblong, acute, ½ lin. long, pale green, membranous, subentire, not ciliated, nearly equal-sided, rounded on both sides at the base, not imbricated over the stem; leaves of the upper plane minute, lanceolate-cuspidate. Spikes nearly as long as the stem, resupinate, 1 lin. diam.; bracts of the upper plane lanceolate, membranous, spreading, squarrose; of the lower plane ovate-cuspidate, ascending.

Hab. Santarem, Amazon Valley, *Spruce* 947!

305. **S. platyphylla**, n. sp.—Stems very slender, 2–3 in, long, ascending, with root-fibres from the lower half, distantly pinnately branched, the lower branches slightly compound. Leaves of the lower plane spaced, except towards the tip of the branchlets, oblique ovate, patent, subobtuse, a line long, bright green, membranous, rounded on both sides at the base, more so on the upper side, not ciliated; leaves of the upper plane one-third as long, oblique ovate. Spikes very short, resupinate, 1-12th to 1-8th in. diam.; bracts distinctly dimorphic, those of the upper plane oblique ovate, erecto-patent; of the lower plane ovate-cuspidate, ascending.

Hab. Kaieteur Falls, Demerara, *E. F. im Thurn*! A near ally of *S. Lychnuchus.*

306. S. AMBIGUA A. Br. in Crypt. Nov. Gran. 370. — Stems slender, suberect, 2–3 in. long, copiously pinnate, the lower branches considerably compound, the tips often produced and whip-like. Leaves of the lower plane spaced, erecto-patent, oblique ovate, acute, $\frac{1}{2}$–$\frac{3}{4}$ lin. long, pale green, membranous, broadly rounded on the upper side at the base and imbricated over the stem, serrulate, not distinctly ciliated; leaves of the upper plane half as long, ovate, shortly cuspidate. Spikes short, resupinate, 1 lin. diam.; bracts of the upper plane erecto-patent, oblique ovate, crowded; of the lower plane rather shorter, ovate-cuspidate, strongly keeled.

Hab. Venezuela, *Fendler* 402! Cumana, *Moritz* 221.

307. S. LYCHNUCHUS Spring Mon. ii. 247.—Stems very slender, suberect from a decumbent base, 3–4 in. long, copiously pinnate, the lower branches slightly compound. Leaves of the lower plane spaced even on the branchlets, more or less ascending, oblique ovate, acute, a line long, bright green, membranous, unequal-sided, broadly rounded, shortly ciliated, and imbricated over the stem on the upper side at the base; leaves of the upper plane half as long, oblique ovate, with a large cusp. Spikes short, resupinate, $\frac{1}{2}$ lin. diam.; bracts very dimorphous, those of the upper plane ovate-lanceolate, erecto-patent, slightly squarrose; those of the lower plane pale, ovate-cuspidate, ascending.

Hab. Guatemala and Venezuela.

308. S. ANOMALA Spring Mon. ii. 247. — *Lycopodium anomalum* Hook. & Grev. — Stems suberect, with root-fibres from the lower part, 4–6 in. long, pinnate, the branches erecto-patent, the lower copiously compound. Leaves of the lower plane contiguous and ascending on the branches, spaced and spreading on the stem, ovate, acute, a line long, dark green, membranous, much dilated, very cordate, strongly ciliated, and much imbricated over the stem on the upper side at the base; leaves of the upper plane half as long, oblique ovate, cuspidate. Spikes copious, resupinate, as broad as the leafy branches; bracts of the upper plane oblique ovate-lanceolate, erecto-patent; of the lower plane ovate-cuspidate, ascending.

Hab. Demerara, *Parker*! Cayenne, *Leprieur*! *Sagot*! 749! 1123! *S. portoricensis* A. Br. in Crypt. Nov. Gran. 372, from Porto Rico, seems from the description to differ mainly from this species by its less distinctly dimorphous bracts.

309. S. LEPTOSTACHYA A. Br. in Crypt. Nov. Gran. 373.—Stems slender, suberect, with root-fibres from the lower half, bisulcate down the face, closely pinnate, the branches erecto-patent, the lower copiously compound. Leaves of the lower plane contiguous on the branchlets, spaced on the main stem, ovate. acute, 1-12th to 1-8th in. long, bright green, firmer in texture than in *S. Lychnuchus*, nearly equal-sided, not ciliated, a little dilated, and slightly imbricated over the stem on the upper side at the base; leaves of the upper plane one-third as long, oblong-cuspidate. Spikes resupinate, reaching an inch or more in length, 1-12th in. diam.; bracts of the upper plane lanceolate-acuminate, erecto-patent; of the lower plane ovate-lanceolate, ascending, strongly keeled.

Hab. New Granada, at Mujo, 2500 ft., *Lindig* 1514!

310. S. KARSTENIANA A. Br. in Crypt. Nov. Gran. 372.—Stems about a foot long, erect from a decumbent base, bisulcate down the face, copiously pinnate, the short erecto-patent branches sparingly compound. Leaves of the lower plane ovate, acute, dark green, subdiaphanous, very unequal-sided, denticulate on the upper margin, much produced on the upper side at the base, and imbricated over the stem; leaves of the upper plane one-third as long, ovate-oblong, cuspidate. Spikes short, often geminate, but little flattened; bracts not very obviously dimorphous.

Hab. New Granada, at Puerto Cabello, *Karsten* 174.

311. **S. ramosissima**, n. sp. — Stems erect, $\frac{1}{2}$ ft. long, simple near the base, copiously pinnate above it, the lower branches decompound. Leaves of the lower plane spaced even on the branchlets, ascending, oblong-lanceolate or lanceolate, acute, a line long, bright green, membranous, nearly equal-sided, serrulate on both sides, rounded, and a little imbricated over the stem on the upper side at the base; leaves of the upper plane half as long, ovate, with a large cusp. Spikes very copious, resupinate, $\frac{1}{4}$–$\frac{1}{2}$ in. long, 1-12th to 1-8th in. diam.; bracts very dimorphous, those of the upper plane lanceolate, ascending, rather squarrose; those of the lower plane ovate-lanceolate, ascending.

Hab. Eastern Peru, near Tarapoto, *Spruce* 4008! A near ally of *S. molliceps*.

312. S. STENOPHYLLA A. Br. in Ann. Sc. Nat. 4. xiii. 83.—*S. macroura* Liebm. — *S. Lychnuchus* Fourn. Fil. Mex. 148, non Spring.—Stems suberect, pale straw-coloured, $\frac{1}{2}$–1 ft. long, acutely angled on the face, with root-fibres from the lower half, copiously pinnate, the lower branches copiously compound. Leaves of the lower plane spaced even on the branchlets, ascending, oblong-lanceolate, subobtuse, 1-12th to 1-8th in. long, unequal-sided, serrulate on the upper edge, rounded, and imbricated over the stem on the upper side at the base; leaves of the upper plane one-third to half as long, oblique ovate, cuspidate. Spikes short, resupinate, 1 lin. diam.; bracts of the upper plane lanceolate, erecto-patent; of the lower plane ovate-lanceolate, ascending, serrulate.

Hab. Mexico, *Bourgeau* 1654! *Hahn* 2156!

Var. *rigidiuscula* Fourn. is a form of exposed places, with shorter more rigid leaves than in type, and nearly square spikes with indistinctly dimorphous bracts. *S. albospica* Hort. is a form of this species.

INDEX OF SPECIES.

[The following is a complete list of the species and synonyms enumerated in this paper. This will be convenient for reference, as the paper has extended over three volumes of the Journal. The first list is confined to the names published under *Selaginella;* species published for the first time have a * affixed; synonyms being in italics. After each name is given in brackets the number prefixed to the species, followed by the year and page of the Journal in which it will be found. The second list is of species published under *Lycopodium,* and is entirely synonymic. — Ed. Journ. Bot.]

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NOTES ON THE INOCULATION OF FISHES WITH *SAPROLEGNIA FERAX*.*

THE following notes are extracts from Reports made from time to time by Mr. G. Murray to Prof. Huxley. They have special reference to the transmissibility of the disease :—

I.

"On February 2nd, 1882, I received from Prof. Huxley several flies covered with *Saprolegnia ferax*, which had been obtained by him from a diseased Conway salmon in the previous December. The cultivation of this fungus was continued, and four inoculations were made with it on *Salmo ferox* during July, but without success.

"Oogonia and oospores were found in the cultivations for the first time on January 31st, 1883, very nearly a year from the time I obtained it, and after fourteen months of cultivation, during which period a constant and almost daily watch had been kept on it.

"With this fungus, of which the zoosporangia and oospores were plentifully ripe, I attempted the inoculation of two healthy specimens of *Salmo ferox* (February 1st) and two healthy dace

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* [Extracted from (I.) the 22nd, (II.) the 23rd, and (III.) the 24th Annual Reports of the Inspector of Fisheries (England and Wales).]

(February 19th), by rubbing the top of the fish's head with a fly on which the fungus was growing. In the case of one *Salmo ferox* a very slight abrasion of the epidermis over the region referred to had been previously made by gently rubbing it with fine sand.

"Again no result followed these experiments, and on March 2nd they were repeated on the same two dace, this time by rubbing (without previous abrasion) the left side of the fish midway between the gills and the tail-fin. The change in the region rubbed was made in consequence of the observation that on nearly all the diseased dace I had seen the part named was commonly the first affected, the right side equally with left. On March 5th each of these fish had a small tuft of what was afterwards found to be *Saprolegnia ferax* growing on the region of inoculation, and by March 10th it had grown to a large patch. On this day one of the fish escaped from the water, and when found was lying dead close to the vessel in which it had been confined. It then bore a similar appearance to the other, as regards the progress of the disease. The other died on March 16th, its body being nearly covered with a luxuriant growth of *Saprolegnia ferax*, the oospores of which were present, but sparingly.

"Of the eight unsuccessful experiments half had been made before the appearance, and half in the presence, of oospores. Since, however, none had been successfully made in the absence of oospores, I determined to enquire if that affected the possibility of infection. Two healthy dace were therefore rubbed, on March 26th, over the same region as in the successful cases, with *Saprolegnia ferax*, on which neither oogonium nor oospore could be found, the zoosporangia being plentiful, however, and numerously ripe. In both cases the experiment was successful, and indeed the activity of the disease appeared to be greater from the fact that one fish succumbed in ten days and the other in fourteen.

"In the case of the fish which died on the tenth day the body was nearly covered with the fungus, but in the case of the other which died on the fourteenth day the disease was confined to one side, extending from the mouth over the gills down to the tail-fin, both sides of which, however, were badly affected.

"On both fishes, contrary to my expectation, oospores were more numerous than on those individuals which had been inoculated with oospore-bearing material."

II.

"In continuation of the inoculation experiments with *Saprolegnia ferax* made last year on the dace, I have begun a fresh series this time on fishes belonging to the *Salmonidæ*, and the results are briefly as follows:—

"The agent used in all the inoculations was *Saprolegnia ferax*, directly continued by cultivation from the fungus obtained by Prof. Huxley in December, 1881, from a diseased Conway salmon. These cultivations have been maintained since then on the fly, and observed almost daily. The fungus of this stock, if it may be so termed, was used last year in the inoculation experiments on the dace, and it has at different times been observed to grow freely on pieces of bladder, young cockroaches, and a variety of other hosts. In the autumn of last year oospores were formed on it within a week of their corresponding appearance in the previous year,*—and this year they were first detected on January 29th, two days before their first occurrence last year.

"The first inoculation experiment of the present series was begun on February 1st, when oospores were few in number. The fish was a healthy *Salmo fario*, and the inoculation was made (as in all following cases) by rubbing several flies bearing the fungus on the top of the fish's head without any abrasion of the epidermis. The disease was first observed on the fourth day in the form of a patch of numerous short filaments on the region rubbed. From this it extended gradually, and the fish (as in all other cases described here) showed symptoms of irritation, followed after a time by languid movements, and finally died on the fourteenth day after inoculation, February 15th. On February 12th another inoculation was made, the conditions being precisely the same as the last, except in this respect—that the fungus used bore many oospores, but very few ripe zoosporangia. No appearance of successful inoculation followed, and on the 20th, after I had given up all hope of any result, I went to Scotland for a fortnight, leaving the fish in an apparently healthy state. Returning on March 5th, I was surprised to find it extensively diseased, and in fact dying. It died on the following day—three weeks and two days after inoculation. A few oospores were found on the fungus growing on the fish, as sometimes occurs in other cases. I may venture to put forward here a supposition, which seems to me to throw light on this case. The material used was, as already mentioned, rich in oospores, but bearing few ripe zoosporangia. I have frequently observed oospores germinate in 'hanging drop' cultivations after a period of about a fortnight. Supposing this inoculation was effected by the product of oospores germinating after such a period, the remaining time was sufficient for the development of the fungus to the condition observed on my return. Most unfortunately, and to my great regret, I left no arrangements for having the fish watched and its appearance noted, as I had quite given up hope of result from the experiment, and in the absence of evidence this supposition is ventured.

"At an early period of the late Fisheries Exhibition a considerable number of fish died in the aquarium from the disease, and this was coincident with the presence of much lime in the water from the newly-constructed artificial rockwork. To determine the part played, if any, by lime in the water in cases of disease, Prof. Huxley suggested to me certain experiments, of which the following is the result:—

"On March 7th two healthy *S. fario* were inoculated in the manner just described. In both cases the disease appeared on the third day, progressed in the fashion described, and the fishes died, the one on the twelfth day, the other on the fifteenth day, after inoculation. At the same time the experiment was extended to two other healthy *S. fario*, and the only difference made was that, in the latter case, the fishes were supplied with water containing about half per cent. of lime-water added. Here, again, the disease appeared on the third day on both fishes, but on the eighth day they died, not so extensively diseased as those in ordinary water—the fungus infesting them being in amount almost equal to that on the fishes of the corresponding experiment after the same period of time. They died soon after the beginning of what may be called the time of languid movements. Before these inoculations were made newly-killed flies were rubbed on the mucous coating of all the fish, and these flies were then placed in cultivation by themselves, some in ordinary water and others in the water containing lime from the supply-cistern. On none of these flies did *Saprolegnia* appear, but in a few days they were covered with a common mould —just as has happened in all my attempts to obtain *Saprolegnia* by simply placing flies in water (whether ordinary water or water containing lime), though this method has succeeded in the hands of many other observers in other places.

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* In a cultivation of different origin.

"A fresh attempt was then made on March 15th with a more convenient arrangement of tanks, the subject of experiment this time being young salmon hatched in the Fisheries Exhibition. These fish were, or rather, I should say, are—since they are still alive, except one—parr, beginning to lose their spots. They were all perfectly healthy in appearance. Three of them were placed in each of the four tanks—two tanks supplied with ordinary water, and two with water containing lime, this time about ¼ per cent. The three in one tank from each of the pairs of tanks were inoculated, the two other tanks remaining untouched as check experiments (in all cases a similar arrangement has been made); and, after a slight appearance of the fungus on inoculated fishes living under both conditions, the promise of success was not fulfilled, and by March 20th they were all apparently healthy again. Similar cultivation experiments with flies rubbed as before on the fish previous to inoculation were made, and again there was no result. On March 20th the whole of the experiment of the 15th was repeated on the same fishes. The slight appearance of the disease followed as before, gradually diminishing, and has disappeared except in three cases—two in ordinary water and one in water containing lime. One of these fishes I have killed, and examination shows a slight development of the fungus, more in the epidermis than externally; and the others remain, giving some promise of success. A negative result was again obtained with the flies rubbed before inoculation.

"I should state that in all successful cases the disease has first appeared on the region of inoculation, and from there it has spread not always continuously; sometimes an outbreak has occurred on a new place, most frequently on the tail. The time from inoculation to death corresponds with the periods in the cases of inoculated dace. The temperature variations affect the cultivations so slightly (except, of course, extreme heat and cold) that I am not at present disposed to attach much value to their influence in cases of inoculation, and certainly nothing has yet been observed of any value in this direction. The water containing lime was prepared in a cistern from which a supply-pipe led to two tanks bifurcating, and thus serving each from the same source.

"These experiments at least furnish starting-points for fresh experiments, from which it is to be hoped some light may be obtained as to the influence of the presence of lime."

III.

"During the latter part ot spring and the early summer of last year a considerable number of the fish inhabiting the tanks in the Fish Culture Museum suffered from the attacks of *Saprolegnia.* The young salmon, which had been hatched in the Fisheries Exhibition and reared in the Fish Culture Museum, suffered most, and nearly all of those attacked died. This outbreak was entirely unexpected, and, considering the circumstances under which it took place, its origin was at first inexplicable. The water in which the fish in question were living came from the same source as that which had a great number of times undergone the test of immersing flies in it without these showing a sign of the growth of *Saprolegnia.* I applied this test again to water taken before it entered the tanks, and the supply remained as pure as before; while, as would be expected, water from the tanks themselves yielded *Saprolegnia* readily. It was thus made certain that the disease was not conveyed to the fish through the water supply, and the next direction enquiry took was to ascertain if by any means the disease had been communicated to these fish from those in adjoining tanks, which were the subject of inoculation experiment. Careful enquiry brought no result. The experiments were being conducted in an isolated manner, and the landing-nets, &c., used in the capture and handling of diseased fish had never been employed in other tanks. In my difficulties Prof. Huxley, foreseeing that the result of such an enquiry could not fail to be instructive, encouraged me to prosecute it, and suggested that the food given to the fish might be the vehicle of the infectious material. A consideration of this enabled us to pitch upon the earthworms used for this purpose as most likely to yield result. Several of these were intercepted while being conveyed to the tanks for food, and were placed under cultivation. After the lapse of two days the *Saprolegnia* unmistakably showed itself, and, though comparison satisfied me of the identity of this fungus with that of the disease, the matter was put to absolute proof by using this fungus as the agent of inoculation in the final successful experiment recorded last year. Examination disclosed the presence (in two cases) of oospores in the earthy contents of the worms, and these, I believe, were the oospores of *Saprolegnia.* I never succeeded in finding any worm at large on which the *Saprolegnia* was growing, and, though the ground was damp, I was sufficiently surprised to find alive even the resting-state of this purely aquatic fungus, since desiccation at an ordinary temperature soon kills it. The fact that I ceased to find worms bearing *Saprolegnia* as the summer advanced I attribute to the great dryness which resulted from the exceptionally hot weather.

"The immediate cause of the outbreak having been thus ascertained, the grave question remained,—where did the earthworms obtain the *Saprolegnia?* I procured worms from various parts of the country, including the neighbourhood of a river [the Tweed] which contained diseased fish, and on none of these could *Saprolegnia* be reared without inoculation. I continued to find it on earthworms—though not on all—procured from a piece of waste ground adjoining the Fish Culture Museum, and it soon became notable that worms only from a certain region (a few yards in diameter) of this ground yielded the fungus. It could never be found on those dug up in the adjacent grounds of the Natural History Museum. Now, over the particular region indicated there were lying a number of fish-bones, which at once aroused curiosity. The remarkable results obtained by M. Pasteur in his observations on earthworms as carriers of infectious material suggested a clue to the way out of the difficulty, though I was unwilling to believe, as I am now, that this aquatic fungus could maintain life for any length of time in the ground. However, the discovery that the bones just mentioned belonged to certain fish which had died in the tanks erected by the Fisheries Exhibition Commissioners, and had been so cast out there a few months before, seemed to point in the direction which my suspicions took. Mr. Edon (to whom I am much indebted for assistance throughout this enquiry) informed me, however, that to the best of his knowledge worms for food were never dug up in that particular place, and its appearance bore out his belief. Matters remained for some time in this unsatisfactory position, until, in going over the ground one day, I observed a labourer digging in the very region which had been infected. On questioning him he succeeded in remembering having once or twice in rainy weather earlier in the year obtained his worms from there. (It was near shelter.) The agreement thus established forces upon me the conclusion that the infectious material was obtained from the dead fish cast out,—that during the damp weather it remained alive in its resting-state, and was spread abroad in the ground by earthworms, and that it was finally conveyed by them into the tanks where the outbreak took place. Later in the year, as described, this source of infection was dried up, while the outbreak was stopped by the precautions Mr. Edon took in his treatment of the fish.

"Towards the end of November a species of *Dictyuchus* hitherto unknown to me began to appear along with the *Saprolegnia* in the cultivations. It rapidly increased in power, and in the course of a few days obtained complete possession; and the *Saprolegnia*, which had first been placed in cultivation three years before (all but a few days) by Prof. Huxley entirely disappeared. The suddenness and completeness with which it was driven from the field were highly impressive, as well as not a little annoying after a period of attention to it of so long duration. However, the circumstance had its significance, in exhibiting the existence of a powerful competition with the *Saprolegnia*. Whence did it come? What influence does it exert at large on this disease of fishes in thus driving it from its stronghold in the bodies of insects, &c., in water? Especially, what is its action on the skin of fishes?"

HEPATICÆ OF SUFFOLK.

By the Rev. E. N. Bloomfield, M.A.

In common with several other counties in the East of England, Suffolk has no hills worthy of the name, the air is dry, and the rainfall but scanty. Hence we need not be surprised that this family is represented by few species, and even these occur but sparingly.

The only common species are *Frullania dilatata* and *Radula complanata*, on trees; *Marchantia polymorpha*, *Conocephalus conicus*, and *Pellia epiphylla*, on sides of streams, &c.; and *Lophocolea bidentata*, in shady places. Even the usually common *Diplophyllum albicans* has not yet been met with in Suffolk.

In the following enumeration I have used the nomenclature of the 'London Catalogue of British Mosses and Hepaticæ,' ed. ii. 1881.

My best thanks are due to Mr. W. M. Pearson, of Pendleton, Manchester, for kindly verifying my specimens, and thus enabling me to speak decisively, as far as I had specimens to submit to him.

Marchantia polymorpha L. Common.

Conocephalus conicus L. Common.

Targionia hypophylla L. The specimen figured in Engl. Bot. was sent from Nayland. I know no other Suffolk station. W.

Riccia glauca L. Not uncommon in clover fields, &c. — *R. crystallina* L. This rare species was gathered on Thetford Heath by the Rev. W. M. Hind, LL.D., of Honington. W.

Ricciella fluitans L. Hitcham, *Professor Henslow*. Hopton, *Hist. Yar.* Lound.

Ricciocarpus natans L. Hitcham, *Prof. Henslow*. Lakenheath, *Suff. Fl.* Hadleigh, *Ray*. W. I have seen specimens of both these species from Hitcham.

Frullania dilatata L. Very common. — *F. Tamarisci* Mich. This was gathered from an ancient barrow on Troston Heath by Dr. Hind. W.

Radula complanata L. Common.

Porella platyphylla L. Not uncommon.

Lepidozia setacea Mitten. This is recorded from several stations near Lowestoft, Belton, Ashby, and Westleton. I have gathered it at Belton. E.

Odontoschisma Sphagni Dicks. Belton Bogs, *Hook. Jung.* I have gathered it in this station. E.

Cephalozia Francisci Hook. Near Herringfleet Decoy, *Hook. Jung.* Mr. Pearson detected this species mixed with a small form of *J. ventricosa* in a packet collected by Mr. Eagle at Tuddenham, and marked by him *J. excisa?*—*C. byssacea* Hook. Far from uncommon on heaths and exposed ground in Norfolk and Suffolk, *Hook. Jung.*—*C. divaricata* Sm. I have specimens gathered by Mr. Eagle at Mildenhall. W. Are not these two species identical? —*C. bicuspidata* L. Tuddenham; Belton, &c. Probably somewhat common.—*C. connivens* Dicks. Among *Sphagnum* at Westleton, Tuddenham, and Belton.

Lophocolea bidentata L. Common.—*L. heterophylla* Schrad. In alder cars in Suffolk, *Hook. Jung.*

Kantia Trichomanis L. Probably occurs wherever there are boggy spots; but these are few and far between.

Blepharozia ciliaris Nees. Tuddenham; Santon Downham; Barton Mills.—Lound, *Suff. Fl.*

Scapania compacta Roth. (*resupinata*).—Not infrequent in Norfolk and Suffolk under stems of *Erica, Hook. Jung.* Herringfleet, *Hist. Yar.* There are specimens of this species unnamed, from Tuddenham, in Mr. Skepper's herbarium.—*S. irrigua* Nees. I have a specimen from Belton. E.—*S. undulata* is recorded from Belton and Tuddenham; but it may very probably be *S. irrigua* which is intended.—*S. nemorosa* L. Woolpit and other woods, *Suff. Fl.* Tuddenham; Lowestoft. I have a specimen from the latter locality.

Plagiochila asplenioides L. Not uncommon.

Mylia anomala Hook. Westleton Bogs, *Hook. Jung.* Belton. E.

Jungermannia crenulata Sm. Tuddenham; Westleton; Belton. —*J. exsecta* Schmid. Westleton Heath, *Hook. Jung.* Tuddenham; Herringfleet.—*J. ventricosa* Dicks. A small form of this occurs on heaths, and is probably recorded as *J. excisa*, of which Hooker writes, "Hedge-banks and heathy places near Yarmouth." Mildenhall, *Eagle.*—*J. incisa* Schrad. Herringfleet and Westleton, *Hook. Jung.* E.—*J. inflata* Huds. Tuddenham, *Sk. Herb.* W.

Nardia scalaris Schrad. Ashby Warren, *Mr. Turner, Hist. Yar.* E.

Fossombronia pusilla Nees. Herringfleet in 1811, *G. R. Leathes, Hist. Yar.* E.

Pellia epiphylla L. Santon Downham; Ickworth; Great Glemham. Probably common.

Aneura pinguis L. Herringfleet, *Hook. Jung.* E.—*A. multifida* Dill. Belton, &c., among *Sphagnum, Hist. Yar.* Tuddenham and Lakenheath, *Skepper.* Lowestoft. I have a specimen from this locality.

Metzgeria furcata L. Bury, Felsham Wood, Great Glemham, &c. Probably common.

Sphærocarpus terrestris Mich. Probably not uncommon. Bury; Great Glemham.

Anthoceros? punctatus L. Tuddenham, *Sk.* Wangford, *Eagle.* Holton, *Suff. Fl.* I have seen it at Tuddenham, but have no specimen.

NOTE.—In addition to the above the following are recorded, but I believe erroneously:—

Saccogyna viticulosa Mich. Among *Sphagnum*, common, *Hist. Yar.* This was probably *Mylia anomala* Hook.

Trichocolea tormentella Ehrh. Recorded by Withering. Probably *Blepharozia ciliaris* Nees was the plant intended.

E. = Eastern Division; W. = Western Division. If neither of these marks are added, the species occurs in both vice-counties.

ON A NEW SPECIES OF *GUSSONEA*.

By H. N. Ridley, M.A., F.L.S.

Among the plants recently collected by M. Leon Humblot in the Comoro Islands occurs a species of this genus, which appears as yet to be undescribed. The genus is typically characteristic of the East African archipelago, occurring also on the mainland. It is remarkable for its copious and long roots, absence of leaves, excepting for a few sheaths upon the stem, and minute flowers. The present species, in its long slender stem and very small flowers, approaches *G. aphylla* Rich., but the spur is cylindrical, tapering gradually to a point, which, with the narrow petals, distinguish it clearly from the rest of the genus. The roots are slightly flattened, somewhat rough, and fewer than in *G. exilis* Ridl.

Gussonea cornuta, n. sp.—Radices copiosæ elongatæ compressæ; caulis repens, longa, subpedalis, gracilis, vaginis arctis teretibus acutis, dissitis striatis tecta; scapi graciles, unciales; bracteæ dissitæ membranaceæ vaginantes ampliatæ apicibus acutis; flores ad 8 iis *G. aphyllæ* paullo majores; pedicelli graciles quam bracteæ multo longiores sepala ovata subacuta, lateralia parum curva; petala linearia obtusa; labellum rotundatum 4-nervium, basi columnam amplectens, calcar longum attenuatum curvatum, pallide flavescens; omnia tenuia, pallida (ex-sicco); columna crassiuscula brevis aurantiaca, fovea triangularis, profunda, rostellum elongatum lanceo-triangulare decurvum; anthera ovata, pollinia minuta, pyriformia. Comoro Islands, L. Humblot, No. 238. Herb. Brit. Mus.!

SHORT NOTES.

Astragalus alpinus in Perthshire.—On the grassy slope of a hill in Perthshire, much frequented by tourists, I was astonished to find this summer *Astragalus alpinus*. The only other station in Scotland where it undoubtedly grows is Little Craigindal, Braemar. I searched for it in vain in Glen Dole, Clwa, some years ago, and I am told that it has not been met with there since the date of its discovery. On the same hill I found *Oxytropis Halleri*. When staying at the Botanical Camp near Loch Lyon two months ago

I gathered specimens of a *Carex*, which experts pronounce to be *Carex ustulata*, reported by Don from Ben Lawers in 1810. It has apparently not been found since, and is therefore characterised in the appendix to Hooker's Flora as "one of Don's reputed discoveries." Scotch botanists are highly gratified by this confirmation of Don's trustworthiness.—JAMES BREBNER.

PINGUICULA ALPINA IN SUTHERLANDSHIRE.—In the late summer of 1884 Mr. W. J. Ball, of Harrow, gathered *Pinguicula alpina* near the sea, at no great elevation, in the Loch Inver district of Sutherlandshire. This I believe to be a new county record.—E. S. MARSHALL.

SUFFOLK MOSSES.—The Rev. E. N. Bloomfield's list of Suffolk Mosses (Journ. Bot. 1885, 233) prompts me to send a list of a few which I found during a recent stay in the east of the county, and which are additions to that list, either as being new to the county or to the vice-county formed by the eastern half.

Species new to the county:—*Sphagnum cymbifolium* var. *squarrosulum* Nees, Lound; *Campylopus flexuosus* Brid., Walberswick; *C. paradoxus* Wils., Walberswick; *C. fragilis* B. & S., Lound; *Barbula marginata* B. & S., Blythburgh; *B. papillosa* Wils., Wrentham; *Orthotrichum tenellum* Bruch., Wrentham; *Eurhynchium pumilum* Wils., Lound.

Species new to the vice-county:—*Plagiothecium undulatum* L., Fritton Water; *Barbula intermedia* Brid., Blythburgh; *Orthotrichum saxatile* Brid., Burgh Castle.—H. N. DIXON.

POLYGONUM MARITIMUM IN S. DEVON. —Having recently been staying for a week or two in South Devon, I had the good fortune to find *Polygonum maritimum* growing near Dawlish beside *P. Raii*, *Salsola Kali*, and other commoner seashore plants. My friend Mr. H. T. Mennell drew my attention to its rarity (it has been recorded for North Devon, but not, I think, before for South Devon), and he, as well as Mr. Arthur Bennett and Mr. Archer Briggs, who have seen the specimens, agree that they are true *P. maritimum*.—W. F. MILLER.

REDISCOVERY OF ERIOPHORUM GRACILE IN SURREY. —In June last I met with this rare cotton-grass in a bog in the basin of the River Blackwater, where, though very local, it was fairly abundant. Some notes on its habitat may be interesting. The plant is entirely confined to the wettest parts of the bog, growing, in peaty water, among *Sphagnum* and the roots and stems of the various bog plants, two or three feet about the peat itself. Although the roots, which proceed from the base of the flower-stem and from the fascicle of leaves which terminates the stolon, are longish, as described by Mr. Townsend (Fl. Hants), they do not seem to reach the peat below, and the plant appears to live entirely among the moss. It does not occur even on wet peat, and would evidently be quite unable to exist on the comparatively dry peat which often suffices for its allies; thus its disappearance on the approach of drainage is explained. The spikes, when in bud, and stolons, are much more slender than those of *angustifolium*, the former being elliptic, and of a beautiful grass-green colour. It will be seen from these notes that the term *underground*, as applied to the stolons, does not correctly describe the Surrey plant, though this would, of course, not be apparent even in the fresh specimens from which Mr. Townsend's description was drawn. It has long been extinct in the Whitemoor Common station, whence a specimen, gathered in 1848, and seen by Mr. Arthur Bennett, is the last record known to me of its occurrence there.—W. H. Beeby.

Wiltshire Plants (see p. 274). — Mr. Druce's unsuccessful search for *Carex tomentosa* at Marston Maisey goes to prove that this species has at least become extremely rare there. I have had repeated hunts after it myself, always in vain, the last being towards the close of the June of this year. Even so, I can hardly bring myself to believe in the entire extermination—through the partial draining of the water-meadows—of this particular *Carex* in a spot where some dozen of its congeners still continue to flourish. The fact, however, remains that for some years past the plant has not been found there. I observe Mr. Druce records *Chara hispida* from the neighbouring canal. I also observed it there on my last visit, and have never seen it there before, though I have frequently botanised along the banks, from which I conclude that it does not appear every season. As Mr. Druce states, *Iris acoriformis* Bor. is the prevalent form there, but I noted true *Pseudacorus* in ditches near Marston Maisey Village (Wilts). I think it probable the immature *Sparganium* he mentions as most likely *neglectum* would turn out to be merely *ramosum*. A month ago I believed our Woodchester plant to be the former, so like did its young fruit seem to the figure in 'Journal of Botany.' However, as it gradually ripens, I find that it is showing itself to be, day by day more clearly, nothing but *ramosum*.—H. P. Reader.

Draba muralis L. in Dorset.—I found this plant in May last in the extreme north-west of Dorset, at Higher Wambrook, about one mile and a half west of Chard. Many of the stems were quite simple. It grew on a very limited area of elevated limestone. This record extends its range southwards from North Somerset.—W. Bowles Barrett.

Podocarpus insignis Hemsl. = P. argotænia. — I very much regret to find that I have given a new name (see p. 287) to a species of *Podocarpus* described by Dr. Hance in the 'Journal of Botany,' 1883, p. 357. Mr. Ford, who is now in this country, called my attention to the fact; and, when he sent the specimens to Kew, he wrote mentioning that the plant had been published by Dr. Hance, though he did not remember the name for the moment; but that letter was not before me at the time I described the plants. It is, however, quite inexcusable on my part to have overlooked Dr. Hance's published description, especially as I have access to Mr. Forbes's references to all the plants described by the former. In extenuation I may add that my description includes the male inflorescence, which was unknown to Dr. Hance.—W. Botting Hemsley.

Pimpinella magna in West Lancashire. — This plant is not recorded for West Lancashire in 'Topographical Botany,' ed. 2. It is one of our commonest Stonyhurst plants, on both sides of the Ribble—much commoner than *P. Saxifraga*. The two often grow close together, *P. Saxifraga* on dry slopes, *P. magna* in places where it can obtain more moisture. We are working out the flora of our district, and shall be glad of any help in so doing.—C. A. Newdigate, S. J., St. Mary's Hall, Stonyhurst.

ADDITIONS TO THE BOTANICAL DEPARTMENT OF THE BRITISH MUSEUM DURING 1884.

By W. Carruthers, F.R.S.

The principal additions to the collection during the year have been :—The extensive collection of species of *Rosa* formed by the late M. Déséglise, and containing the types of his species, and the materials on which his numerous memoirs are based, was acquired by purchase; the collection of *Algæ* from different regions of the world formed by the late Prof. Dickie, together with his notes and drawings, illustrating the species he has described in various journals, has been purchased; the herbarium of Robert Pocock, of Gravesend, containing plants collected in Kent in the beginning of the century, has been presented through the instrumentality of his biographer, George M. Arnold, Esq. There have also been recorded 123 species from France, presented by A. Bennett, Esq.; 96 species of European plants, presented by C. C. Lacaita, Esq.; 300 specimens of *Hieracia*, by Naegeli; 5 species of *Dianthus*, presented by F. N. Williams, Esq.; a valuable collection of Indian plants, formed and presented by A. F. Young, Esq.; 590 species of plants from North Western India, obtained by exchange from J. F. Duthie, Esq.; 43 species of plants from Aden, collected and presented by Major Yerbury; specimens of *Leontopodium*, from the Himalayas, presented by Emil Boss, Esq.; 275 species of plants from Northern Syria, from Prof. Post; 976 species of plants from Asia Minor, collected by Sintenis; 2 new species of plants from Cochin China, presented by the Rev. B. Scortechini; 990 species of plants from Java, Sumatra, and Timor, collected by H. O. Forbes, Esq.; 407 species of plants from Borneo, collected by Grabowski; 14 species from East Tropical Africa, collected and presented by the Rev. J. Hannington; 600 species of plants from Madagascar, collected by Dr. Hildebrandt; 227 species from Madagascar, collected by the Rev. R. Baron; 406 species from Natal, from J. M. Wood, Esq.; 546 species from South Africa, collected by Mr. J. M. Wood, and presented by A. E. Gibbs, Esq.; 24 species of Cape plants, from Mrs. S. Skipwith; 111 species of plants from St. Helena, presented by F. E. Grant, Esq.; 253 species of plants from New South Wales, collected by the Rev. J. Lamont; 30 species of plants from Australia, presented by Baron von Mueller; 23 species of plants from Australia.

presented by Mrs. Coker Beck; 30 species of plants from Tasmania, presented by A. Bennett, Esq.; 55 species of North American plants, from Prof. Asa Gray; 19 species of plants from North America, presented by A. Bennett, Esq.: 605 species of plants from Western America, collected by Lemmon; 240 species of North American plants, collected by Curtiss; 2745 species of plants from California, Arizona, and New Mexico, collected by Marcus E. Jones; 155 species of plants from Washington Territory, collected by Suksdorf; 470 species of plants from the United States and Mexico, collected and presented by W. Carruthers, Esq.: 483 species of plants from Mexico, collected by Schaffner; 289 species of plants from Mexico, collected by Kerber; 46 species of cultivated orchids, presented by H. Veitch, Esq.; 4 species of cultivated orchids, presented by B. S. Williams, Esq.; a cultivated orchid, presented by the Hon. and Rev. J. T. Boscawen; 69 species of European Ferns, 131 species of Ferns from India, 9 species of Mosses, 9 species of Lichens, 55 species of *Algæ*, all presented by Mrs. F. Skipwith; 91 species of Fungi from Western America, collected by M. E. Jones; 330 specimens of *Graphideæ* from Cuba, collected by Wright; 100 species of Scandinavian *Algæ*, collected by Wittrock and Nordstedt; 3 species of fresh-water *Algæ* from Persia, collected and presented by W. Simpson, Esq.; 12 species of *Algæ* from the Hot Springs of the Yellowstone Park, collected and presented by W. Carruthers, Esq.; 7 species of *Characeæ*, presented by Messrs. H. and J. Groves; 27 species of Fungi from South Africa, collected by Wood, presented by A. E. Gibbs, Esq.; 3 species of Fungi, presented by the Rev. J. O'Gorman; 100 species of Fungi of Europe, by De Thuemen; 230 species of Fungi of Europe, by Rabenhorst; 50 species of Ascomycetous Fungi, by Rehm.

To the collection of fruits and seeds have been added:—Specimens presented by Thomas Christy, Esq., F.L.S.; seeds of two species of *Carmichælia*, presented by J. D. Enys, Esq.; fruits of *Sequoia* and *Torreya* from California, presented by J. M. Hastings, Esq.; 16 fruits from North America, collected and presented by W. Carruthers, Esq.; 120 fruits from Sumatra, collected by H. O. Forbes.

To the collection of woods have been added:—14 specimens of woods from the Andaman Islands, presented by Col. Michael; 17 species of North American woods, from Prof. Bickmore; 3 specimens of British-grown woods, from the Rev. R. P. Murray; specimen of St. Helena Ebony, from F. E. Grant, Esq.; 80 specimens of Philippine woods, obtained by exchange from M. Vidal.

The collections of the Botanical Record Club and the Herbarium of Dr. Forbes Young were transferred from the Herbarium of the Royal Gardens, Kew, by authority of Sir Joseph Hooker, to the British Herbarium; to which have been added specimens from Messrs. A. Fryer, W. H. Beeby, C. Bailey, F. R. Coles, G. C. Druce, J. Saunders, A. G. More, F. C. S. Roper, J. W. White, A. Bennett, R. F. Towndrow, J. E. Bagnall, J. C. Mansel-Pleydell, H. G. Glasspoole, J. Benbow, R. M. Middleton, W. Mathews, and A.

Baldwin; the late Dr. W. B. Baikie; Misses Kinahan and Shepard; Revs. E. L. Bloomfield, W. H. Smith, and W. H. Painter; and Sir John Lubbock.

Specimens of abnormal growths in plants have been presented by Mrs. Pierce Butler, Joseph Hayes, Esq., Rev. George Henslow, F. N. Williams, Esq., George Bullock, Esq., W. G. Smith, Esq., R. Holland, Esq., Mrs. Japp, R. M. Middleton, Esq., and Dr. Masters.

To the collection of plates and drawings of plants have been added:—46 original drawings of Fungi, by W. G. Smith; 87 original drawings of Cape plants, by Francis Masson, presented by Charles Lee, Esq.; 26 original drawings of Sumatra and Java plants, by H. O. Forbes; 22 original drawings of Indian Palms, by Roxburgh; an original drawing of *Epipogum Gmelini*, presented by Mrs. Lloyd; 5003 plates of plants; the volume containing the drawings and technical descriptions of plants made in the East by Kamel has been transferred from the Manuscript Department.

A collection of autograph letters of John Ray and his contemporaries, amounting in all to 88 letters, together with the original manuscript of Derham's Life of Ray, has been acquired by the Department.

NOTICES OF BOOKS.

Dictionary of the Names of British Plants. Intended for the use of amateurs and beginners, as a help to the knowledge of the meaning and pronunciation of the scientific names of British wild flowers. By Henry Purefoy Fitzgerald. London: Baillière. 8vo, pp. 90.

When the author began the study of botany, he "experienced a great want in the absence of a book dealing with the names of flowers." It is to be regretted that neither then nor since has he come across Mr. Alcock's 'Botanical Names for English Readers': had he done so, he would have found the work he has here undertaken already accomplished, and that in a more satisfactory manner. He, however, includes the names of varieties, which Mr. Alcock omits: but the mode of treatment is very unsatisfactory. To be told that *Bachii* is "named after a M. Bach" and *Bellardi* "named in honour of a Mr. Bellard" reminds one of the man who, being asked what was an archdeacon, replied "one who performs archidiaconal functions." To render the book of interest, some information—such as dates of birth and death, and some reference to published works, if any—should have been given; and this might have been done, in the case of dates at least, without adding to the bulk of the book. On the same page with the examples cited we find "*Baltici.* Named after the Baltic, on the shores of which this plant is abundant: *Psamma Baltici*"; but the name is *baltica*, not *Baltici*.

But Mr. Fitzgerald takes more daring flights than this. To be told that *serotina* is "from Latin *sero*, I scatter, probably because the plants so named are widely scattered," is calculated to surprise the reader; but it is quite as likely as that *Samolus* was "named after the Isle of Samos, where the plant was first discovered, by Valerand, in the sixteenth century." Of *aizoides* our author tells us that "*oides* in all words = like; resembling *aiz*." (!)

We can say nothing in commendation of this little book, save that the author's motive in writing it seems to have been an excellent one. But he has not succeeded in carrying it out.

The Report of the Stonyhurst College Observatory for 1884 contains a list of the dates of the flowering of plants during the year.

Mr. H. C. Hart has published in the 'Transactions of the Royal Irish Academy' a "Report on the Botany of Sinai and South Palestine"—the result of his expedition with Prof. Hull in 1883. The descriptive account of the journey is written in that pleasant readable style with which readers of this Journal are familar in Mr. Hart's contributions to our pages, and is followed by a systematic list of the plants collected, about seventy of which are new to Palestine, while three—*Galium petræ*, *Boucerosia Aaronis*, and *Daphne linearifolia*—are here described and figured for the first time.

Mr. Hart also sends us his 'Report on the Flora of Southwest Donegal' (Proc. Royal Irish Acad., 2nd Ser., vol. iv.), which may be regarded as supplementary to his paper in this Journal for 1882.

A pamphlet by M. A. Albert, entitled 'Botanique du Var: plantes nouvelles ou rares' (Draquignan, Latil) contains descriptions of two new species, *Capsella hybrida* and *Bunium collinum* ("*B. Bulbocastanum* L., pro parte"); there are also five named forms under *Capsella Bursa-pastoris*.

The last part (vol. iv., pt. 3) of the 'Proceedings of the British Naturalists' Society' contains the eighth instalment of Mr. Cedric Bucknall's "Fungi of the British District," with three coloured plates; a paper on Apospory in Ferns, by Mr. C. T. Druery; and an instalment (*Trilliaceæ* to *Naiadaceæ*) of the 'Flora of the Bristol Coalfields.'

We are glad to announce the issue of a new part—the ninth—of Dr. Braithwaite's 'British Moss-Flora.' It contains the conclusion of *Tortula*, the description of *Pleurochaæte*, and the greater part of *Mollia*. Twenty-three species are figured on four plates, in the usual style of excellence which has marked this work from its commencement.

Mr. Thomas Kirk sends us a reprint of some papers published in the 'Transactions of the New Zealand Institute,' "On the Flowering Plants and Ferns of Stewart Island" (*Dracophyllum Pearsonii*, *Scirpus muscosus*, *S. ebenocarpus*, *Danthonia crassiuscula*, *D. flaccida*, *Poa Walkeri*, *Polypodium crassium*, spp. nn.); "On the Punui of Stewart Island" (*Aralia Lyallii*, Kirk = *Stilbocarpa*

Lyallii, Armstrong); "Description of a new *Fagus* (*F. Blairii*)" with plate); and "Notes on the New Zealand Beeches." We are sorry to see that Mr. Kirk encourages by example the ugly and unauthorised spelling which substitutes a small initial for the capital in commemorative names.

We are glad to learn that the valuable information contained in the 'Herefordshire Pomona' with reference to the cider and perry industry of Hereford, Worcester, Gloucester, Devon, and Somerset will be issued in a form easily accessible to those who cannot afford the larger work. It will embrace a history of the orchards and their management, a description of the best varieties of fruits, the chemical analysis of their various juices, and an account of the manufacture of cider and perry. Woodcut sections of the best varieties of fruit will be given. The price to subscribers will be 5s.: address, Messrs. Jakeman & Camer, High Town, Hereford.

Dr. Wittrock has issued a first fasciculus, containing twelve numbers, of 'Erythrææ exsiccatæ,' the specimens in which are of great beauty and interest. They are: *E. pulchella* Sm. and *typica;* eight forms of "*E. vulgaris* (Rafn.) Wittr." (which we usually call *E. littoralis* Fr., and which is recognised by Dr. Wittrock as the plant of the 'Novitiæ' ed. i. and of most Swedish authors; *E. glomerata* Wittr., a new species much resembling *E. capitata*, but placed in a different section; *E. Centaurium* L. *α. typica* and *E. capitata α. typica.* This last, from Oeland, seems to us to correspond very closely with Mr. Townsend's var. *sphærocephala*, but Dr. Wittrock (who has compared his specimens with the original ones of *E. capitata* in the Berlin Museum) says that the latter "differt floribus paullo minoribus, laciniis corollæ paullulo magis ovalibus obtusisque, sepalis paullo brevioribus." Notes are attached to each specimen, and in the Botaniska Notiser for 1884, pp. 110--118, other remarks upon them by Dr. Wittrock will be found.

New Books.—A. Dodel-Port, 'Biologische Fragmente: Beiträge zur Entwicklungsgeschichte der Pflanzen' (fol., pp. 104, tt. x.: Cassel, Fischer). — H. Fonsuy & F. Collard, 'Florule de Verviers et de ses environs' (12mo, pp. xliii. 402: Verviers, Vinde). — K. Richter, 'Die Botanische Systematik und ihr Verhältniss zur Anatomie und Physiologie der Pflanzen' (8vo, pp. iv. 174: Vienna, Faesy).

Articles in Journals.

American Naturalist. — J. T. Campbell, 'Age of Forest-trees.' — J. M. Anders & G. B. M. Miller, 'Exhalation of Ozone by odorous Plants.' — A. F. Foerste, 'Fertilisation of *Phaseolus diversifolius*.'

Bot. Notiser (Häft 4).—R. Jungner, 'Några svenska Rumex och Epilobium hybrider' (*Rumex crispus* × *Hydrolapathum* = *R.*

Schreberi Haussk.; *R. Hydrolapathum* × *obtusifolius* = *R. lingulatum*; *R. Hippolapathum* × *obtusifolius* L. = *R. platyphyllus* F. Aresch. = *R. Schmidtii* Hausskn.); *Epilobium palustre* × *roseum*). —E. Ljungström, 'Ohn några Primulaformer.'

Bot. Zeitung (Aug. 28, Sept. 4). — H. Solms-Laubach, 'Die Geschlecterdifferenzirung bei den Feigenbaumen' (1 plate). — (Sept. 11). J. Wiesner, 'Ueber ein Ferment, welches in der Pflanze die Umwandlung der Cellulose in Gummi und Schleim bewirkt.' —(Sept. 18). O. Penzig, 'Zu H. Dingler's Sufsatz: Der Aufbau des Weinstockes.'

Bull. Soc. Bot. France (xxxii.: Comptes Rendus 5). — —. Mougin, 'Sur la zone d'accroissement du *Convallaria majalis*' (1 plate). — W. Johannsen, 'De l'influence de l'oxygène à haute pression sur la respiration de quelques plantes en voie de germination.' — G. Bonnier & L. Mangin, 'Sur l'action chlorophyllienne.' — —. Gomont, 'Sur deux Algues nouvelles des environs de Paris' (*Microchæte diplosiphon*, sp. n.) (1 plate). — G. Camus, 'Sur les *Orchis militaris, purpurea, Simia*, leurs variétés et leurs hybrides dans la Flore Parisienne' (1 plate). — —. Constantin, 'Recherches sur la Sagittaire.' — M. Gandoger, 'Excursion botanique au Grand St. Bernard.' — L. du Sablon, 'Sur la Symétrie foliare chez les *Eucalyptus* et quelques autres plantes.' — —. Bréal, 'Fixation des Zoospores du *Chlamydomonus pulvisculus* sous l'influence de la lumière.' — X. Gillot, 'Sur le *Viola picta* Moggr. (*V. esterelensis* Chan. & Mill.).'

Bull. Torrey Bot. Club (July). — W. Trelease, 'The Genus *Cintractia*' (1 tab.).

Flora (Aug. 21). — W. Nylander, 'Lichenes novi e Freto Behringen.' — Id., 'Arthoniæ novæ Americæ borealis.' — (Sept. 1–21). J. Schrodt, 'Das Farnsporangium und die Anthere' (1 plate). — (Sept. 21, Oct. 1). J. Müller, 'Lichenologische Beiträge.'

Gardeners' Chronicle (Sept. 5). — 'Dr. Von Regel.' — *Adiantum Mairisii* Moore, n. hyb.—*Aristolochia elegans* Mast., sp. n. (fig. 64).— N. E. Brown, 'Terrestrial Orchids of S. Africa' (contd.). — G. Brebner, 'Disease of Anemones' (*Peronospora pygmæa*: figs. 66, 67). —(Sept. 12). 'Seed-vessels of Orchids' (*Epidendrum* and *Phajus*: figs. 70–73). — *Hoya Griffithii* (fig. 74). — (Sept. 19). *Oncidium crocodiliceps* Rchb. f., *Calanthe colorans* Rchb. f., spp. n. — *Comparettia macroplectron* (figs. 77, 79). — G. S. Jenman, 'Proliferation in Ferns.'—W. G. Smith, '*Puccinia Gentianæ*' (fig. 82).—(Sept. 28). *Cyrtanthus hybrida* N. E. Br., n. hybr. — *Leptactina tetraloba* N. E. Br., *Zygopetalum Klabochii* Rchb. f., spp. nn.—*Picea Morinda* (fig. 85). — Peloria of Foxglove (fig. 86). — Seed-vessels of *Lælia* (figs. 88, 89).

Midland Naturalist.—F. Fowrke, 'First Discovery of the Cholera Bacillus.'—J. E. Bagnall, 'Flora of Warwickshire' (*Gramineæ*).

Nature (Sept. 24).—W. B. Hemsley, 'The Forster Herbarium.'

Proc. Linn. Soc. N. S. Wales (vol. x. pt. i.: June).—W. Woolls, 'The *Proteaceæ* of Australia.'

Science-Gossip. — W. B. Grove, '*Haplographium*' (*H. bicolor*, sp. n.: figs. 127–30).

BOTANICAL NEWS.

The Scottish Rights of Way Society of Edinburgh has recently sent an active deputation to traverse some of the mountain-paths in the centre of the Highlands, and particularly to erect guide-posts. This expedition has dealt with the Braemar district, and made an excellent beginning. Botanists who have been excluded from Glen Doll, Clova, will be glad to hear that a guide-post has been erected at its foot, indicating through it a "Public path to Braemar." Another notice-board erected previously by Mr. Macpherson, the proprietor, stands beside it with the inscription, "Private entrance to Glen Doll." Experience has proved, since this step was taken by the Rights of Way Society, that visitors on being challenged have only to assert their determination to proceed to gain access to this beautiful and botanically interesting spot. Admirable as the action of the Society is in recovering for the public so many ancient paths, yet it will be matter for regret, especially to naturalists, if this much should satisfy the public demand for "access to mountains." Game-keepers will still confine travellers to certain tracks, and thus exclude the naturalist from his most interesting hunting-grounds. While the gratitude of botanists is due to the Society for such benefits, there should be no relaxing of efforts in favour of Mr. Bryce's "Access to Mountains Bill," which is intended to provide wider access everywhere.

The portrait of Mr. Bentham—a copy of that in the rooms of the Linnean Society—for which subscriptions were invited some time since in these pages, has been placed in the Kew Herbarium.

OBITUARY.

Mr. Joseph Sidebotham, J.P., F.L.S., &c., of Erlesdene, Bowdon, Cheshire, was perhaps—at all events latterly—better known as an entomologist than a botanist, his collections of British Lepidoptera and Coleoptera ranking among the finest in this country; but most of his attention in his earlier years was bestowed upon the study of Botany. In his native place, Apethorne, near Hyde (he was born in 1824), he devoted much time to the exploration of the Tame Valley, adding no less than twenty-five species to those previously rendered. A life-long friend of Mr. L. H. Grindon, the latter dedicated to him his 'Manchester Flora,' published in 1859, "in admiration of his talents as a successful student of Nature in all its branches, and of Botany in particular." For many years he was a frequent contributor to the 'Phytologist.' Nor did he alone turn his attention to Phanerogamia—Cryptogams merited a full share of his research, and he particularly studied the Musci, Fresh-water Algæ, and Diatomaceæ. Respecting the Musci, as he informed the writer of this notice, he was unable to procure a copy of Wilson's 'Bryologia Britannica' at the time of its first publication, and so, borrowing the book from a friend, he most diligently and faithfully copied the whole of the plates, including the magnificent drawings—a work involving infinite trouble and patience. He was for many years a partner in the well-known calico-printing firm called "The Strines Printing Company," retiring only in 1876, upon becoming possessed of large properties in the neighbourhood of Hyde and elsewhere, which came to him upon the death of a relative. When at Strines he was always endeavouring to interest his work-people in Natural Science, and gave up much time to them, especially in contributing articles of interest to the 'Strines Journal,' a MS. record of the Botany and Natural History of the locality. Mr. Sidebotham was for thirty-three years a member of the Manchester Literary and Philosophical Society, and was particularly active in the management of its Microscopical and Natural History Section, for several years acting as Secretary, and serving on the Council. He was also one of the founders of the Manchester Photographic Society, and, in company with Mr. Grindon, of the Manchester Field Naturalists' Society. A most intimate friend of James Nasmyth, the inventor and astronomer, it was to him that the first discovery by Nasmyth of the "willow leaves" structure of the sun's photosphere was addressed. Indeed, Mr. Sidebotham was himself no mean astronomer, and had erected a small observatory in his grounds, in which was placed a remarkably fine telescope. A man of more varied accomplishments it would be almost impossible to find. A great lover of church music, he was a splendid performer on the organ, and had built a large one in his house at Bowdon. Erlesdene was in fact a perfect treasure-house, stored with beautiful and rare objects of Nature and Art, all witnessing to the innate force and culture of the man, by their arrangement or by their selection. Those whom he numbered among his intimate friends, and they were many, unanimously testify to his kind, unselfish, and simple child-like nature—never so happy as when doing good and benefiting others. Three years ago he built, at a large expense, and endowed the beautiful church of St. Anne, Haughton, near Denton, but just before the consecration he had the great misfortune to lose his wife. He never seemed quite the same man afterwards; his health, which had not for some time been strong, necessitating wintering abroad for two or three years, gradually declined still more, and though his friends hoped he was gradually mending in the spring of this year, he passed away on Saturday, May 30th, in the sixty-second year of his age, widely and deeply regretted.

J. C. M.

SPICILEGIA FLORÆ SINENSIS: DIAGNOSES OF NEW, AND HABITATS OF RARE OR HITHERTO UNRECORDED, CHINESE PLANTS.

By H. F. Hance, Ph.D., Memb. Acad. Nat. Cur., &c. &c.

IX.

1. *Clematis* (*Viticella*) *Stronachii* Hance.—Ad Pa-kong, jurisdictione Tsing-ün, prov. Cantonensis, 130 m. p. ab urbe, d. 4 Apr. 1882, leg. rev. B. C. Henry. Only known previously from Chinkiang, in Kiang-su province, about 500 miles north of the station now recorded.

2. *Clematis* (*Flammula*) *orientalis* L.—Circa Ha-mi, Turkestaniæ chinensis, Maio 1881, leg. W. Mesny.

3. *Salomonia* (*Epirhizanthes*) *aphylla* Griff.—In jugo Lo-fau-shan, prov. Cantonensis, m. Sept. 1883, leg. rev. E. Faber. Only hitherto known from Tenasserim, Malacca, and the Malay Islands.

4. *Hypericum* (*Euhypericum*) *Holosepalum*) *attenuatum* Choisy.—In jugo Lo-fau-shan, prov. Cantonensis, alt. 3100 ped., m. Sept. 1883, leg. C. Ford. Not previously collected south of Kiu-kiang, in the extreme north of the province of Kiang-si.

5. **Actinidia fulvicoma**, sp. nov.—Ramis glaberrimis purpureo-cinereis, ramulis dense fulvo-lanatis, foliis ovato-lanceolatis acuminatis basi plerumque subcordatis margine setaceo-serratis supra sparsim hirtellis costa strigosa subtus tomento stellato denso pallide ferrugineo tectis 2–4 poll. longis 1–2 poll. latis petiolo fulvo-lanato 4–6 lineali, pedunculis petiolum æquantibus 1–3 floris, floribus polygamis, sepalis oblongis extus cum bracteolis linearibus densissime fulvo-lanatis 2 lin. longis, petalis oblongis obtusissimis 3 lin. longis, fructu oblongo 8–10 lineali.

In jugo Lo-fau-shan, prov. Cantonensis, m. Maio 1883, leg. rev. B. C. Henry. (Herb. propr. n. 22293).

There is a great similarity between all the species of this genus, but the present seems to differ from all those yet described by its indumentum.

6. *Thea bohea* L.—In collibus silva densa virginea tectis, juxta pagum Ta-man-tai, territorii indigenarum Lai dictorum, ins. Hai-nan, d. 14 Nov. 1882, coll. rev. B. C. Henry. Mr. Henry tells me that he cannot doubt that tea is really wild here, as it occurs here and there in the thick jungle, associated with other plants. Tea is not cultivated at all by the Lai tribes, nor do they use it as a beverage; but they pluck and dry the leaves of the wild plant, and supply the Chinese settlements with a small quantity of what is called "Lai tea."

7. *Gossypii* sp.—Leaves entire or shortly 3-lobed; bracteoles palmately laciniate, with slender much attenuated segments. Flowers *white*. Fruit bony, used in dyeing, but, according to Mr. Henry, produces no cotton. Juxta Lam-ko, ins. Hai-nan, d. 21 Oct. 1882, leg. rev. B. C. Henry. I do not know what to make of

this: it is very like a species gathered on the seashore at Gatope, New Caledonia. (Vieillard, n. 130.)

8. *Kleinhoria hospita* L.—In silvis primævis ins. Hai-nan, d. 7 Nov. 1882, leg. rev. B. C. Henry. Not previously, I believe, recorded from China.

9. *Helicteres spicata* Colebr. var.? *hainanensis.* — Recedit a typo foliis late ovatis, basi æqualiter cordatis v. obtusis, inæqualiter grosse eroso-dentatis, 4 poll. longis 2½–3 poll. latis, petiolo pollicari, calycibus pilis stellatis incanis stipitatis vestitis. Flores badii. Juxta Lam-ko, ins. Hai-nan, d. 24 Oct. 1882, leg. rev. B. C. Henry. Probably not separable specifically from *H. spicata!* but its very broad three-nerved leaves and a difference in the clothing of the calyx give it a distinct aspect.

10. **Elæocarpus** (Dicera) **Henryi**, sp. nov.—Ramulis angulatis atropurpureis glaberrimis v. tenuissime puberulis, foliis membranaceis oblongis obtusis basi in petiolum sensim cuneatis undulato-crenatis crenis minute calloso-glandulosis glaberrimis supra vix lucidulis subtus opacis costa subtus prominula venis tenuibus 2½–3¼ poll. longis 1½ poll. latis petiolo trilineali, racemis ad 1½ poll. longis patentibus v. recurvis laxifloris rachi pedicellisque bilinealibus tomentellis, sepalis lanceolatis tomentellis margine incanis lineam longis, petalis sursum dilatatis ad medium usque laceris 1½ lin. longis, staminibus circ. 10 antheris tenuiter tomentellis imberbibus, disco conspicue 5-lobo cum ovario dense cano-tomentoso, stylo tomentello stamina superante.

Ad Sai-chü-shan, secus fl. North River, prov. Cantonensis, m. Junio 1883, coll. rev. B. C. Henry. (Herb. propr. n. 22287.)

This differs by the thinner texture of its leaves and smaller flowers from any species known to me. I should station it near *E. amœnus* Thw.!

11. *Impatientis*, sp. nov.—Secus fl. Lien-chau, prov. Canton. m. Oct. 1882, leg. rev. R. H. Graves. Only a solitary specimen found, and insufficient for examination; but which, though without fruit, I think belongs to Sir J. D. Hooker's *brachycarpæ subcapitatæ*. *I. chinensis* Lam. is, so far as I know, the only species hitherto found in South China, whilst *I. noli-me-tangere* L. occurs in the north.

12. **Chailletia hainanensis**, sp. nov. — Frutex 12-pedalis ramulis angulatis ferrugineo-pilosis, foliis chartaceis oblongo-lanceolatis basi obtuse cuneatis apice acuminatis supra præter costam strigillosam glaberrimis opacis subtus pallide ferrugineo-pilosis costa costulis venisque reticulatis tenuibus prominulis 4 poll. longis 1½ poll. latis petiolo bilineali, cymis brevissimis plurifloris, floribus brevissime pedunculatis hermaphroditis, sepalis oblongis obtusis extus dense cano-tomentosis basi leviter connatis, petalis lineari-subspathulatis apice bilobo lobis divergentibus glaberrimis (ex amici collectoris notula) lutescentibus 2 lin. longis sepala duplo excedentibus, staminibus petalis æquilongis basi cum iis in annulum brevem connatis antherarum connectivo dorso incrassato, glandulis hypogynis parvis quadratis, ovario libero cano-tomentoso stylo apice trilobo stamina paulo superante glaberrimo.

Prope Wo-shi, ins. Hai-nan, d. 1 Nov. 1882, leg. rev. B. C. Henry. (Herb. propr. n. 22286.)

No species of this interesting genus, respecting the affinities of which there is some divergence of opinion amongst botanists (Cfr. Baillon in 'Adansonia' xi. 102), had previously been recorded from China. The Hai-nan plant differs from all the species of our Indian empire by its bisexual flowers, in which respect it agrees with *C. sumatrana* Miq. It is not unlike the Amazonian *C. capitulifera* Spruce, except in the texture and vestiture of the leaves.

13. **Celastrus cantonensis**, sp. nov.—Scandens, cortice rubescente, foliis coriaceis elliptico-oblongis acuminatis parce et remote spinuloso-denticulatis utrinque subtiliter elevato-reticulatis 1¾–2 poll. longis 7 lin. latis petiolo bilineali, paniculis laxis multifloris, floribus sæpe ternis, calycis segmentis ovatis obtusiusculis, capsula obovoideo-subglobosa 3 lin. longa trivalvi stylo brevi coronata, stigmate capitato nunc lobulato, semine arillo flavido obvoluto.

Ad Lung-tau-yin, secus fl. North River, prov. Cantonensis, d. 15 Aug. 1882, coll. operarius horti Hongkongensis. (Herb. propr. n. 22191.)

Very closely allied to *C. monosperma* Roxb., but with narrower, thinner leaves, a different inflorescence, and smaller fruit. Flowers not seen.

14. *Rubus* (*Malachobatus, hexagyni*) *Swinhoei* Hance.—In montibus Lo-fau-shan, prov. Cantonensis, alt. 2600 ped. m. Maio 1883, leg. J. Calder. Only known hitherto from Formosa. This differs from all other members of the group by its numerous ovaries, but I cannot doubt that its nearest relative is *R. acuminatus* Sm.

15. **Casearia** (IROUCANA) **subrhombea**, sp. nov. — Foliis coriaceis rhombeo-ovatis acuminatis basi cuneatis a triente inferiore ad apicem serratis serraturis calloso-glandulosis glaberrimis subtripli- et penniveniis venis reticulatis utrinque prominulis 2½–3 poll. longis 16–19 lin. latis petiolo bilineali, racemis densifloris 3 lin. longis rachi tomentosa pedicellis brevissimis bracteolisque lanceolatis tomentellis, calycis lobis ciliatis.

In m. Fun-yun, prope Shui-kwan, prov. Cantonensis, leg. C. Ford. (Herb. propr. n. 22290.)

Distinguished by the shape of the leaves, and their glandular serratures.

16. *Ammannia* (*Euammannia*) *senegalensis* Lam. — In montibus Pak-wan, prope Cantonem, m. Nov. 1884, leg. T. Sampson. Not, I believe, previously gathered in South China.

17. *Acanthopanax ricinifolia* Seem. — In prov. Shan-tung, circa Chi-fu, d. 6 Sept. 1880, legg. Forbes & Carles. A Japanese species, not, I believe, previously recorded from China.

18. **Hedyotis** (DIPLOPHRAGMA) **bracteosa**, sp. nov. — Glaberrima, radice crasse fibrosa, caule brevi tetragono noduloso, foliis oppositis v. summis subverticillatis membranaceis oblongo-lanceolatis obtusiusculis lucidulis supra dilute viribibus subtus pallentibus penninerviis nervis tenuibus leviter arcuatis supra parum prominulis 5–6 poll. longis 10–14 lin. latis, pedunculis axillaribus et terminalibus folio duplo v. plus duplo brevioribus simplicibus v.

semel trichotomis, capitulis densissimis circ. 8 lin. diametro basi bracteis 4 ovatis ea superantibus stipatis 2 exterioribus majoribus et latioribus, floribus sessilibus, capsula crustacea globosa, seminibus in quovis loculo pluribus nigris angulatis rugulosis.

In jugo Lo-fau-shan, prov. Cantonensis, m. Sept. 1883, leg. rev. E. Faber. (Herb. propr. n. 22223.)

The specimens have fully ripe dehiscent fruit, so that I cannot describe the flowers. It is very closely allied to *H. verticillaris* Wall. ! but readily distinguished by the colour and venation of the leaves, the greater size of the capitula, and the shape of the conspicuous involucral bracts. In the 'Flora of Brit. India' (vol. iii. pp. 53, 54), Sir Joseph Hooker refers to two Chinese species received from me, under their numbers. The first had been described in these pages (Journ. Bot. 1879, 11) more than a year previously, by the name of *H. effusa*; the other as long ago as 1862 (Ann. sc. nat. 4e. sér. xvii. 221) under that of *H. consanguinea.*

19. **Hedyotis xanthochroa,** sp. nov. — Perennis, caulibus tetragonis sulcatis tomentellis demum glabratis, foliis sessilibus elongato-ovatis supra scabridis subtus breviter strigilloso-pilosis sub lente nigro-glandulosis 7-nerviis nervis subtus tantum conspicuis 1½–2¼ poll. longis 8–12 lin. latis flavidis, stipulis lanceolatis strigoso-pilosis et nigro-glandulosis, cymis terminalibus breviter pedunculatis densis subcapituliformibus bracteis foliis homomorphis sed minoribus stipatis, calyce piloso ad duas tertias longitudinis in segmenta lineari-lanceolata diviso 3 lineali, corollæ cæruleæ utrinque pilosæ 5½ lin. longæ tubo cylindraceo laciniis ligulatis apice recurvis tubo æquilongis, genitalibus e tubo exsertis, filamentis glaberrimis.

In jugo Lo-fau-shan, prov. Cantonensis, alt. 3400 ped., m. Sept. 1883, leg. C. Ford. (Herb. propr. n. 22297.)

In the absence of fruit it is impossible to determine the proper sectional position of this distinctly-marked species; but I suspect it belongs to *Diplophragma*, though unlike any other known to me.

20. *Morinda villosa* Hook. f. — In jugo Lo-fau-shan, prov. Cantonensis, m. Sept. 1883, coll. C. Ford. Only previously known from the Khasia mountains. Mr. Ford's plant was determined at Kew.

21. **Lasianthus** (NUDIFLORI) **Fordii,** sp. nov.—Præter stipulas petiolos venas venulasque subtus strigosas glaber, foliis membranaceis elliptico-lanceolatis exquisite caudato-acuminatis basi cuneatis costulis ad utrumque latus 5 tenuibus valde arcuatis suprema in acumen continuata trabeculis tenuissimis connexis subtus magis conspicuis 3½–4 poll. longis 1–1½ poll. latis petiolo tenui 4–5 lineali, stipulis parvis triangulatis, drupa subsphærica dentibus calycinis brevibus triangulato-subulatis strigillosis coronata 2 lin. alta, pyrenis 4.

In jugo Lo-fau-shan, prov. Cantonensis, m. Sept. 1883, leg. C. Ford. (Herb. propr. n. 22280.)

Judging from the description, for I have seen no specimens, this is most nearly allied to *L. japonicus* Miq., a species overlooked by Franchet and Savatier.

22. **Eupatorium** (EXIMBRICATA) **melanadenium,** sp. nov.—Caule erecto teretiusculo striato superne ramoso pilis brevibus appressis scabrido, foliis per totam caulis longitudinem dispositis oppositis ovato-lanceolatis basi rotundatis apice acutis remote grosse calloso-serratis supra scabris subtus pallidis glabratis glandulisque nigris impressis crebre consitis 1¼–2½ poll. longis petiolo semilineali, corymbis brevibus densifloris in capitulum congestis, pedunculis bracteis linearibus instructis, capitulis 5-floris, involucri squamis circ. 10 inæqualibus exterioribus multo brevioribus omnibus lineari-lanceolatis acutissimis pilis brevibus glandulosis septatis scabris, floribus albidis, achæniis angulatis costatis piceis nitentibus brevibus.

In jugo Lo-fau-shan, prov. Cantonensis, m. Sept. 1883, leg. C. Ford. (Herb. propr. n. 20511.)

Most nearly allied apparently to *E. Lindleyanum* DC., but certainly different from that, as well as from all the Asiatic species I have seen. The E. Tatarian plant referred to *E. Lindleyanum* in the 'Flora Hongkongensis' is no doubt *E. Kirilowii* Turcz., which is, in my opinion, quite distinct.

23. *Codonopsis lanceolata* Benth.—In jugo Lo-fau-shan, prov. Cantonensis, m. Sept. 1883, invenit rev. E. Faber. A remarkably interesting addition to the Kwang-tung flora, this very lovely species having up to the present been known only from Japan, Manchuria, and the extreme north of China.

24. *Campanula* (*Eucodon*) *fulgens* Wall.—Juxta Shui-kwan, secus fl. North River, prov. Cantonensis, m. Nov. 1883, leg. rev. B. C. Henry. Not previously known from China. In Mr. Henry's specimens, which are quite smooth, the flowers are either single or 2–3 together on a peduncle, and borne on a long raceme at a considerable distance from each other: the setaceous calyx-teeth are four times as long as the tube, and the corolla is divided to the base into very narrow segments shorter than the calyx-teeth.

25. *Adenophora verticillata* Fisch.—Ad fl. North River, prov. Cantonensis, prope Shui-kwan, m. Nov. 1883, leg. rev. B. C. Henry. A north-east Asiatic and Japanese plant, now for the first time recorded from South China.

26. *Diospyros eriantha* Champ.—In jurisdictione Hung-mo, territorii indigenarum Lai dictorum, ins. Hai-nan, d. 21 Nov. 1882, leg. rev. B. C. Henry. More hairy than specimens from Hongkong, which are, indeed, sometimes almost glabrous.

27. *Symplocos caudata* Wall.—In prov. Fo-kien, a. 1861, coll. De Grijs. (*S. Swinhoeana* Hance); in collinis, Ning-po, Apr. 1877, leg. W. Hancock; in jugo Lo-fau-shan, prov. Cantonensis, Sept. 1883, coll. C. Ford.

28. *Osmanthus fragrans* Lour.—In jugo Lo-fau-shan, prov. Cantonensis, m. Oct. 1883, fructiferam leg. rev. E. Faber. The only fruiting specimen I have ever seen. The drupe is oblong, about 9 lines long, and has a tendency to dry with a number of longitudinal blunt angles or ribs, and the putamen is crustaceous.

29. *Mitrasacme* (*Mitragyne*) *indica* Wight.—In herbidis humidis juxta Cantonem, raram invenit T. Sampson, Nov. 1884. Found

by myself near Amoy, in October, 1857, and by Mr. Sampson at Swa-tow in June, 1866, in both cases very sparingly, and now first recorded from Kwang-tung.

30. *Swertia* (*Ophelia*) *vacillans* Hance.—In collibus circa Namfung, ins. Hai-nan, d. 6 Nov. 1882, leg. rev. B. C. Henry. This is, I think, nearest *S. diluta* Benth. & Hook. f., from which it is undistinguishable in appearance, but differs by the scale covering the foveolæ.

31. *Ipomæa pileata* Roxb. — Juxta Wo-chi, ins. Hai-nan, d. 31 Oct. 1882, leg. rev. B. C. Henry.

32. *Ipomæa capitellata* Choisy.—Prope Wo-chi, ins. Hai-nan, d. 31 Oct. 1882, leg. rev. B. C. Henry.

33. *Paulownia imperialis* Sieb. & Zucc. — Juxta oppidum Shui-kwan, ad ripas fl. Kam-kong, in fl. North River influentis, prov. Cantonensis, circ. 300 m. p. a metropoli septentrionem versus, m. Dec. 1883, leg. rev. B. C. Henry. Not previously recorded from Kwang-tung.

34. *Centranthera Brunoniana* Wall.—In jugo Lo-fau-shan, prov. Cantonensis, m. Sept. 1883, coll. rev. E. Faber. I have seen no authentic specimen, but the Chinese plant agrees well with Bentham's diagnosis, and as to the dimensions of calyx and corolla. When the monograph in the 'Prodromus' was published (1846), Martaban was the only locality where it was known to occur, and I have no means here of ascertaining its distribution, according to more recent investigations.

35. *Chirita obtusa* C. B. Clarke in D.C. Mon. Phan. v. pt. i. p. 113.—Herbacea, caulescens, 6–8 pollicaris, foliis ellipticis acutis inæqualiter serratis supra passim subtus præcipue secus nervos una cum caule pilis albidis septatis villosis circ. 4 poll. longis petiolo 9–18 lineali, cymis axillaribus et terminalibus laxifloris, pedicellis divaricatis v. refractis 4–5 lin. longis, calycis 5-fidi semipollicaris laciniis linearibus, corollæ $2\frac{1}{4}$ pollicaris cum inflorescentia tota glanduloso-pilosæ e tubo gracili albido leviter sensim ampliatæ lobis ovatis acutis violascentibus, genitalibus faucem haud attingentibus, capsula tenui lineari 4-pollicari, stylo stigmate breviter bicruri coronato.

In jugo Lo-fau-shan, prov. Cantonensis, m. Sept. 1883, leg. rev. E. Faber. (Herb. propr. n. 22221.)

I had described this as new, under the name of *C. longituba*, but Mr. Ford gave me the above name, as received from Kew. I leave my original diagnosis. The species is evidently a very close ally of my *C. macrosiphon* (Ann. sc. nat. sér. 5, v. 321), but still perfectly distinct.

36. *Hygrophila phlomoides* N. ab E.—Ad Lam-ko, ins. Hai-nan, d. 31 Oct. 1882, coll. rev. B. C. Henry.

37. *Gmelina chinensis* Benth. — In jugo Lo-fau-shan, prov. Cantonensis, m. Sept. 1883, leg. rev. E. Faber. A single specimen, the only one I have ever seen of this very rare plant. I find the corolla pubescent, and the leaves with the under surface densely studded with white glands, such as are met with in many *Clerodendra* ; besides which they are clothed with short hairs.

38. **Plectranthus** (Isodon, Euisodon) **veronicifolius**, sp. nov.—Caule strigoso, foliis membranaceis lanceolatis acuminatis basi cuneatis a medio ad apicem remote argute serratis supra præter venas squamulosas glaberrimis subtus pallidioribus minute glanduloso-punctatis $1\frac{3}{4}$–$2\frac{1}{2}$ poll. longis 5 lin. latis petiolo strigilloso 4-lineali, paniculæ terminalis semipedalis rachi strigilloso-pilosa cymarum pedunculis ramis pedicellisque gracillimis, calycis tubo lineis 5 squamulosis percurso, corollæ tubo calyce duplo longiore, staminibus labium corollæ inferius longiuscule superantibus.

In præfectura Hung-mo, territorii indigenarum Lai dictorum, ins. Hai-nan, d. 21 Nov. 1882, leg. rev. B. C. Henry. (Herb. propr. n. 22298.)

Closely allied to *P. Gerardianus* Benth.! with which it agrees in inflorescence and flowers, but with different foliage.

39. **Anisochilus sinense**, sp. nov.—Caule erecto pilis retrorsis strigoso, foliis oblongis acutiusculis basi cuneatis crassis utrinque dense cinereo-strigosis nervis subtus prominentibus $1\frac{1}{4}$ poll. longis 6 lin. latis petiolo bilineali, spicis terminalibus simplicibus breviter pedunculatis cylindratis densissimis 2–4 poll. longis, foliis floralibus ovatis obtusis, calycis densissime cinereo-strigosi dente superiore ovato obtuso, corollæ labio antico extus strigoso-hirsuto.

Juxta Lam-ko, ins. Hai-nan, d. 24 Oct. 1882, leg. rev. B. C. Henry. (Herb. propr. n. 22207.)

This pretty genus is new to the Chinese flora.

40. *Peperomiæ* sp. ("*Piper ovalifolium* Hb. Wight?" Professor Oliver in sched. Fordiana). In prov. Cantonensi, ad Wong-lun-kun, Aug. 1883, leg. C. Ford. This is very like Wight's plate of *P. dindygulensis* Miq. (Ic. pl. Ind. or. vi. t. 1921), of which, however, I have seen no specimen.

41. **Machilus salicina**, sp. nov. — Foliis coriaceis lineari-lanceolatis basi cuneato-attenuatis apice acuminatis glaberrimis supra vix lucidis subtus opacis glaucescentibus utrinque minute scrobiculato-reticulatis costa subtus prominente nervis primariis numerosis tenuibus arcuatis 4–5 poll. longis incl. petiolo 4–5 lineali 7–9 lin. latis, paniculis fructiferis folio circ. æquilongis laxis paucifloris glaberrimis, perigonii fructiferi laciniis lanceolatis obtusis 3 lin. longis, bacca globosa nigra circ. 5 lin. diametro.

Juxta Mo-lam, ad fl. West River, prov. Cantonensis, d. 22 Maii 1882, leg. C. Ford. (Herb. propr. n. 22190.)

42. *Daphne* (*Daphnanthes*) *odora* Thunb.—In montibus Lo-fau-shan, prov. Cantonensis, m. Jan. florentem invenit rev. E. Faber. Only previously recorded from Japan and Formosa.

43. *Celtis* (*Euceltis*) *japonica* Planch.?—Ad radices montium Lo-fau-shan, prov. Cantonensis, alt. 900 ped., m. Sept. 1883, leg. cl. C. Ford. The specimens were determined by Prof. Oliver.

44. *Cudrania triloba* Hance.—Secus fl. West River, prov. Cantonensis, d. 20 Maii 1882, coll. cl. C. Ford. I have not before seen specimens from any locality south of Kiang-su province.

45. **Pilea** (dentatæ) **Wattersii**, sp. nov.—Caule lignoso angulato glaberrimo brunneo, foliis membranaceis lanceolatis acuminatis basi rotundatis a triente inferiore ad apicem obtusiuscule

serratis trinerviis nervis basalibus ultra medium folium evanescentibus supra parce hirtellis demum glabratis utrinque ad nervos pilosulis 4–6½ poll. longis 13–22 lin. latis petiolo 8-lineali, stipulis scariosis lanceolatis acuminatissimis linea media dorsali margineque ciliatis persistentibus 5–6 lin. longis, cymis laxe paniculatis ad 7 poll. longis basi longe nudis, bracteis scariosis linearibus persistentibus 3 lin. longis, floribus ? (inapertis).

In ins. Formosa, juxta Tam-sui, m. Aprili 1882, coll. am. T. Watters. (Herb. propr. n. 22296.)

Presumably near *P. oxyodon* Wedd.

46. *Spiranthes stylites* Lindl.—In prov. Fo-kien, leg. am. C. de Grijs. Previously gathered in Che-kiang by Fortune.

47. **Peliosanthes macrostegia**, sp. nov.—Foliis ad rosulam 2 membranaceis 5 poll. longis medio 12–17 lin. latis sub lente minute pellucido-punctatis venis verticalibus 13–17 inæqualibus venulis transversis inconspicuis petiolo 5-pollicari, scapo angulato flexuoso tripollicari a basi fere florente, pedicellis solitariis cernuis bilinealibus, bracteis scariosis ovato-lanceolatis acuminatis comosis inferioribus 10 lin. longis 4–5 lin. latis summis 4 lin longis 2½ lin. latis, perianthii (in sicco) pallide brunnei 6 lin. diametro segmentis ovato-oblongis, coronæ ore subintegro.

In jugo Lo-fau-shan, prov. Cantonensis. (Herb. propr. n. 22282.) Communicated by Mr. Ford.

48. *Ophiopogon japonicus* Ker α. *genuinus* Maxim. — Colitur Cantone, ad areas hortorum cingendas, rarissime tamen floret. Only known wild from Korea and Japan, but it is highly improbable so common a garden plant in South China should have been derived from thence. Maximowicz notices its indisposition to flower under cultivation in Europe. The specimens before me exactly resemble wild ones gathered at Nagasaki by Oldham.

49. *Lycoris Severzovii* Reg. ?—In cœmeteriis, Ningpo, copiose cum *L. radiata* Herb., m. Aug. 1877, leg. W. Hancock. I have seen no authentic specimen of the Turkestan plant, but this is evidently different from, though a good deal like, *L. radiata*; and, as the stamens are shorter than the perigone-lobes, I infer from the remarks in the 'Genera plant.' (iii. 728) that this is referable to Regel's species. Mr. Hancock says the flowers are "blue-pink," which does not convey any very definite idea to my mind.

50. *Juncus Leschenaultii* J. Gay.—In prov. Fo-kien legit De Grijs. The only Chinese specimen I have ever seen of this species. All those which have come under my observation are referable to *J. sinensis* J. Gay; and, although this is reduced to *J. Leschenaultii* in the 'Flora Hongkongensis,' I entirely agree with Dr. Buchenau ('Krit. Verzeichn. Juncaceen,' 68) that the two plants are quite distinct. *J. Leschenaultii* is a perennial, belonging to the division *Articulati veri* of the late Dr. Engelmann's Revision of the North American *Junci*, and is scarcely to be distinguished from the common form of *J. acuminatus* Michx.! whilst *J. sinensis*, which is annual, falls by the structure of its leaves into the *Articulati ensifolii* (Trans. Acad. Sc. St. Louis, ii. 435–6), and is no doubt nearest in affinity to *J. xiphioides* E. Mey. ε. *triandrus* Engelm.

51. *Potamogetonis* sp.—Ad fl. Lien-chau, prov. Cantonensis, m. Oct. 1882, coll. rev. R. H. Graves. A solitary fragment of a distinct-looking plant, with opposite, very crispate leaves (the lamina 3 in. and petiole ¾ in. in length) terminated by a conspicuous rigid apiculus, 1 line long, a thick peduncle with a dense spike of flowers about an inch long, and a single fruit, bright brown in colour, obliquely ovoid, faintly ribbed, and with a very short beak. I have little doubt that this is identical with the plant referred to by Maximowicz (Fragm. ad fl. As. or. cognit. mel. 59) as found at Peking, in the Philippines, and the Malay Archipelago.

52. *Cyperus* (*Mariscus*) *dilutus* Vahl.—Ad radices montium Pakwan, supra Cantonem, vere 1884, leg. T. Sampson. Very fine specimens of this showy species, of which I have seen none from any other locality in China.

53. *Carex pediformis* C. A. M.—In collibus prope Hu-chau, prov. Che-kiang, d. 15 Apr. 1881, coll. Carles et Forbes. I had not, before the receipt of this specimen, seen Chinese ones from any locality south of the Peking mountains.

54. *Pteris quadriaurita* Retz. var.—Juxta pagum Ta-men-tin, in territorio indigenarum Lai, ins. Hai-nan, d. 24 Oct. 1882, leg. rev. B. C. Henry. This agrees quite well with Agardh's brief diagnosis of *P. Grevilleana* Wall. (Rev. sp. gen. Pter. 23), and equally so with Mr. Baker's note on a Borneo fern collected by Mr. Burbidge, and named by him as var. *digitata* (Journ. Bot. 1879, 40), but I have seen neither. Though very different in habit from well-developed specimens of *P. quadriaurita*, it is, I have little doubt, referable to that species. The costal spinules are very conspicuous.

55. *Asplenium resectum* Sm.—In monte olim ignivomo, nunc exstincto, Ta-tun, jurisdictionis Tam-sui, ins. Formosæ, d. 15 Jun. 1882, leg. W. Hancock. This shows such an evident approach to *A. heterocarpum* Wall. by the greater pellucidness of the leaflets, their narrow more acuminate shape, and the tendency of the sori to be marginal, that I am disposed to think the latter fern may prove to be an extreme form of this widely diffused species.

56. *Aspidium paludosum* Bl. (*Phegopteris distans* Mett.).—Ad limites territorii indigenarum ins. Formosæ, 28 m. p. a Tam-sui, austrum versus, in fruticetis densis, d. 12 Feb. 1882, rarissimum invenit cl. W. Hancock. Only hitherto known from the Indian mountains, Ceylon, and Java. The specimens agree perfectly with a Ceylon one from Dr. Bradford.

57. *Polypodium amœnum* Wall.—In jugo Lo-fau-shan, prov. Cantonensis, m. Maio 1883, coll. rev. B. C. Henry. A native of the loftier Indian mountains, and found in Formosa, but not before, so far as I am aware, in south continental China.

58. *Polypodium Lehmanni* Mett.—In jugo Lo-fau-shan, alt. 2–3000 ped., Maio 1883, satis copiose invenit rev. B. C. Henry. I have seen no authentic specimens, but have determined it from Mettenius' and Baker's diagnoses. It bears small trifid sterile fronds, unlike the fertile ones. Only hitherto known from the Himalaya and Burma.

59. *Polypodium involutum* Mett.—Prope Tam-sui, ins. Formosæ, rarum, m. Jan. 1882, leg. W. Hancock. Much smaller than Ceylon and Nipal specimens, but apparently rather referable to this than to *P. Loxogramme* Mett. Mr. Hancock notes that in the primæval forest it grows on the horizontal branches of trees. Not, that I am aware, heretofore recorded from China.

ADDITIONAL LOCALITIES FOR LAKE-LAND PLANTS.

By Alfred W. Bennett, M.A., B. Sc., F.L.S.

One advantage of the publication of local floras, like Mr. J. G. Baker's recent 'Flora of the English Lake-district,' is that it stirs up both residents and visitors to record deficiencies or additions. To the very great accuracy and value of Mr. Baker's Flora I can bear practical testimony. A very few notes made during a six weeks' stay between Ambleside and Langdale may be worth recording. (W. = Westmoreland; L. = Lancashire.)

Thalictrum flexuosum Bernh. Windermere shore, near Low Wood. Great Langdale; by stream below Langdale Church. W.

Trollius europæus L. Colwith Force; and by stream below the Fall. L.

Nymphæa alba L. Loughrigg Tarn. W.

Nuphar lutea Sm. Loughrigg Tarn. W.

Corydalis claviculata DC. Brathay Valley; several places. W.

Fumaria officinalis L. Near Colgarth Hall, Windermere. W.

Lepidium Smithii Hook. Skelwith. W.

Viola lutea Huds. Furness Fells; near Colwith. L.

Polygala vulgaris L. The only form observed about Skelwith, Loughrigg, and Langdale, was *P. depressa* Wender.

Silene maritima With. Near bed of stream in Great Langdale, below Langdale Church. W.

Malva moschata L. Near Loughrigg Tarn. W. — *M. sylvestris* L. Skelwith; near houses. W.

Hypericum Androsæmum L. Scandale Beck; remarkably fine and abundant at Skelgill, behind Low Wood. W. *Mr. E. T. Bennett.* Colwith Force. L.

Rubus cæsius L. Woods, north side of Elter Water, abundant. W.

Hypochæris maculata L. Still to be found at Humphrey Head, 1885. *Mr. W. R. Nash.*

Serratula tinctoria L. Windermere shore, near Low Wood. W.

Anthemis nobilis L. Apparently thoroughly established and seemingly wild at the Colwith habitat.

Jasione montana L. Common about Loughrigg and Skelwith. W. & L.

Calluna vulgaris Salisb. White variety on Little Loughrigg. W.

Veronica polita Fries, var. *grandiflora* Bab. Near Loughrigg Tarn. W.

Lathræa Squamaria L. By the Friends' Meeting-house, Colthouse, near Hawkshead. L. *Mr. W. Satterthwaite.*

Thymus Serpyllum L. The only form observed was bisexual, and with four stamens.

Utricularia vulgaris L. Loughrigg Fell. W. Park Fell. L.

Primula farinosa L. Loughrigg Fell. W. *Mr. E. T. Bennett.*

Chenopodium Bonus-Henricus L. Remarkably abundant in the Langdale and Skelwith district W., but always near houses.

Habenaria chlorantha Bab. Loughrigg. W.

Potamogeton natans L. Up to 600 yds. above Codale Tarn.

Typha latifolia L. Loughrigg Tarn. W.

Polypodium Phegopteris L. Remarkably fine in woods near Skelwith. L.

Lastrea rigida Presl. Hampsfield Fell. L. *Mr. E. T. Bennett.*

Scolopendrium vulgare Sym. Remarkably scarce in the Langdale district.

Hymenophyllum Wilsoni Hook. Scandale Beck. W. *Mr. E. T. Bennett.*

THE *HEPATICÆ* OF GLOUCESTERSHIRE.

By the Rev. H. P. Reader, B.A., O.P.

The following contribution to the hepaticology of Gloucestershire is the result of personal observation at intervals during five years. It cannot therefore pretend to be complete, but, so far as it goes, will serve to show that this county, which has a deserved reputation for a rich and interesting phanerogamic flora, may also be considered fairly productive in this particular department of cryptogams. I have been fortunate in finding the fruit of several species which, though generally abundant in the barren state, are rarely fertile.

Marchantia polymorpha L. E. & W. Common. Fruit plentiful.

Conocephalus conicus Neck. E. & W. Common. Fruit locally abundant in the spring.

Asterella hemisphærica L. E. On rocks in a field between Sapperton Tunnel and Hayley Wood, 1881, 1885. Fruit.

Lunularia vulgaris Mich. E. & W. Common in gardens and greenhouses. Gemmiferous, but no fruit.

Riccia glauca L. W. Sandy ditch-banks near Littledean. Probably common elsewhere.

Ricciella fluitans L. "Pond near Gloucester," specimen in Gloucester Museum! I have found it near Usk, in the adjacent county of Monmouth.

Frullania dilatata (L.) Dum. E. & W. Abundant on trees, and fruit plentiful.—*F. Tamarisci* (Mich.) Dum. W. So far as I have seen it, quite scarce. On trees in Woodchester Park; on the ground in woods near King Stanley, and Rodborough Common. Barren.

Lejeunia minutissima Sm. W. Rare and very local. On young ash-trees, Woodchester. New record for Dist. 5 (Severn). — *L.*

serpyllifolia Mich. W. On rocks in Forest of Dean; on trees near Woodchester and King Stanley.

Radula complanata L. E. & W. Rather common, and usually fertile.

Porella lævigata Schrad. E. Wood near Stroud! Discovered by Mr. G. Holmes, March, 1885. A most interesting addition to our list, and new record for Dist. 5. — *P. platyphylla* L. E. & W. Rather common on stone walls, less so on trees. Fruit in three localities, March and April, 1885.

Lepidozia reptans L. W. Forest of Dean, where it is probably frequent; one locality near Woodchester.

Cephalozia bicuspidata (L.) Dum. W. Forest of Dean; King Stanley (fruit).

Lophocolea bidentata L. E. & W. Frequent, and often with fruit. A large barren form in shady places. — *L. heterophylla* Schrad. W. Woods, fertile.

Chiloscyphus polyanthos L. W. On wet banks near Minchinhampton and Woodchester. Fruit.

Kantia (*Calypogeia*) *Trichomanis* L. W. In bogs near Littledean.

Scapania undulata Dill. Rivulets and bogs in Forest of Dean. — *S. nemorosa* L. W. Woods and banks near King Stanley and Woodchester.—*S. curta* Mart. Forest of Dean! *Mr. G. Holmes.*

Diplophyllum albicans L. W. Not uncommon. Fruit near Woodchester.

Plagiochila asplenioides L. E. & W. Common. Fruit in some of the hilly woods about Stroud. Fertile plants are smaller, densely cæspitose, with more closely-set leaves.

Jungermannia crenulata Sm. W. Damp sandy ground and bogs. Fruit plentiful in March. — b. *gracillima* Sm. Near Woodchester. W. — *J. incisa* Schrad. W. Near Woodchester. Fruit.

Nardia scalaris Schrad. Rather common. E. & W. Fruit occasional.

Pellia epiphylla L. E. & W. Common and fertile.—*P. calycina* Tayl. E. & W. Frequent by and in streams. Fruit plentiful in March.

Aneura multifida (Dill.) Gray. E. & W. Damp clay banks. Fruit.

Metzgeria furcata (L.) Dum. E. & W. Common on trees. Fruit rare (on beech near Woodchester, 1881).—*M. conjugata* (Dill.) Lindb. W. On banks, Pen Wood, King Stanley.

Anthoceros lævis Dill. W. Sandy ditch-banks near Littledean, with *Riccia glauca*.

The occurrence of several other species, such as *Cephalozia connivens*, *Odontoschisma Sphagni*, *Lepidozia setacea*, and *Blepharozia ciliaris*, may fairly be presumed. So far, however, I have neither seen nor heard of them in the county. Any addition to the above list which may come under my notice I shall hope to record from time to time in the 'Journal of Botany.'

BOTANICAL NOTES OF A TOUR IN CAITHNESS AND SUTHERLAND, JULY, 1885.

By the Rev. H. E. Fox, M.A., and Frederick J. Hanbury, F.L.S.

To the ordinary tourist Caithness does not present a promising field for floral search. The long stretch of wet moorland through which the railway passes is only succeeded by the fringe of coast-cultivation, even less picturesque than the other, and both without a tree or hedgerow to break the monotony of flatness. The flag-stones which mark the divisions of the fields in severely regular lines are not suggestive of much but agricultural economy. The elevation of the greater part is slight, and the sluggish streams which drain the peat-bogs of the central area are quite unlike the brawling burns which the traveller crosses on his northward journey. The district, however, is not without its botanical riches.

The county of Dick could not fail of interest to fellow lovers of Nature. An evening stroll along the banks of the Thurso River did not yield us the *Hierochloe*, which grows almost opposite the spot where the Caithness naturalist lies buried. The plant is at all times difficult to be found, and has probably suffered at the hands of collectors; its season, too, was long past; a single head, however, was gathered about three weeks before our arrival by Mr. A. H. Bremner, of Thurso, which he kindly gave us. *Juncus balticus*, *Carex aquatilis* var. *Watsoni* and *C. ampullacea* were abundant along the margin of the stream. *Vicia sylvatica* was growing on the grassy banks opposite the cemetery, the only locality in which we noticed it in either county. *Trollius europæus*, which is frequent everywhere in the two counties, adorned the meadow herbage. *Viola tricolor* and *Anchusa arvensis* were the characteristic weeds of the cultivated soil, with *Spergula arvensis* and *Lamium amplexicaule*. *L. purpureum* and *L. intermedium* were also common; but *L. album* was not seen, and is said not to grow in the county. *Carum Carui* occurred as a casual by the road-side near Thurso, but was abundant, and had all the appearance of being native further west, on sand-hills at the mouth of Strathalladale. The sand-hills of Murkle Bay produced *Cakile maritima*, *Cerastium tetrandrum*, *Elymus arenarius*, flowering abundantly, and other common maritime plants; and where the ground was wet, *Parnassia palustris*, *Primula veris*, *Pinguicula vulgaris*, and *Orchis latifolia* grew almost down to the sea; the latter was especially fine and abundant, and with its deep crimson flowers was one of the most conspicuous plants of the neighbourhood in almost every field and ditch. *Scilla verna* is common on all the grassy headlands.

Taking the train to Bilbster, we crossed a short piece of wet moorland which surrounds the shallow and boggy Loch Winless. *Aira præcox* and *A. caryophyllea* abound on all the drier spots, as everywhere on the peat-soil through the two counties. *Hippuris vulgaris*, *Comarum palustre*, *Veronica scutellata*, *Catabrosa aquatica*, and *Chara fragilis* were noted in ditches at the head of the lake. In the lake itself the most interesting plant was *Nuphar pumila*, not easy of access on account of the treacherous bottom of thick mud, above which it floats. *Equisetum limosum* was abundant, and on a sandy promontory we found *Leontodon pratensis.* In the stream flowing out of the lake *Potamogeton filiformis*, *Myriophyllum alterniflorum* (very common also elsewhere), and *Helosciadium inundatum* occurred.

Crossing a slight rise by the main road, we struck the Wick River at the point where it is crossed by the railway. Three hundred yards below this we found *Carex salina β. kattegatensis*, which was discovered for the first time last year by Mr. J. Grant; it was growing in abundance, together with *Carex Watsoni*, and continued on both banks of the river to within a mile and a half of the town. *Mimulus luteus*, thoroughly established in marshy places by the river-side, was flowering in beautiful contrast with *Myosotis strigulosa* Reich. We were unsuccessful in our search for *Ajuga pyramidalis*, which is recorded from the banks of this river; but it was late in the season for this, and the herbage was very high. We gathered *Pyrola media* among the heather about a mile and a half above the town. *Blysmus rufus* and *Scirpus uniglumis*, with other salt-marsh plants, grew lower down among stones at the edge of the river. At Wick we were fortunate in making the acquaintance of Mr. J. Grant, and enjoying the hospitality of his family. This intelligent young botanist has already been successful in adding two plants to the British Flora from his own county, which have escaped previous observers.

The road westward from Thurso passes over the low watershed between the river of that name and the Forss. Besides *Primula scotica*, a very pale and dwarf form of *Anthyllis Vulneraria*, and *Carex dioica* (which latter is common everywhere in marshy places through the two counties), nothing of special interest was noted till the sea was again struck at the mouth of the Forss River. *Ligusticum scoticum* and *Populus tremula* were here growing on the low rocky cliffs near the shore. The common Primrose was still flowering (July 7th) on grassy banks and along the headlands; its exquisite northern congener, *P. scotica*, again occurred in profusion, together with a very dwarf and richly-coloured form of *Euphrasia officinalis*, with capsules much longer than the calyx, apparently the form called *E. maritima* in Hooker's 'Student's Flora,' hitherto recorded only from Shetland. *Silene maritima*, *Plantago Coronopus*, and *P. maritima* presented a curious appearance, on account of their stunted growth and abnormally-thickened leaves.

At Downreay, about two miles west of the Forss, we met with *Oxytropis Uralensis* for the first time; it recurs in more or less abundance along the coast at various places, but we did not notice it further west than the mouth of the Borgie.

Mertensia maritima was gathered in a sandy bay about two miles east of Reay. The sand-hills of this place are full of interest. The burn which flows past the little inn to the sea is choked with masses of a cultivated form of *Mimulus*, which was swept out of a neighbouring garden some years ago by a winter flood, and has now thoroughly established itself for more than half a mile along the stream. *Myosotis strigulosa* was here again in great beauty, and in damp sandy places near the sea *Carex incurva* in some plenty; this is a fairly common sedge on the maritime sands of Sutherlandshire, and, amongst other places, was growing in fine form at Farr Bay and the shores of the Naver. On the Reay links a very large and distinct variety of *Euphrasia officinalis** was noticed, as well as the following:—*Thalictrum minus* var. *maritimum*, *Spiræa Ulmaria*, *Ligusticum scoticum*, and *Habenaria viridis*, which were all growing in the loose sand and struggling with the universal *Psamma arenaria*; and by the rocky margins of a burn to the E. of the Links a *Hieracium* which does not appear to agree with any known British species, and about which we hope to write at a future date.

Melvich, at the mouth of Strathalladale, is worth a visit on many accounts. Besides fair loch-fishing in the neighbourhood, some of the finest coast-scenery in E. Sutherland is close to the village. There is also a comfortable inn, which has not yet been turned into a tourist-haunted hotel. *Oxytropis Uralensis* grows in great luxuriance in several places along the cliffs. *Sedum Rhodiola* descends to the sea-level. On the moors westward *Habenaria albida* is not infrequent.

A little before the main road reaches the Naver it crosses the opening of Farr Bay, where *Botrychium Lunaria* was growing, curiously associated with *Triticum junceum*, *Centaurea Scabiosa*, and *Oxytropis* in dry sand. On broken ground below the cliffs, which rise above the road half a mile east of the Bettyhill Inn, the vegetation was more rich and varied. A tangled undergrowth of blackthorn, hazel, and rowan concealed luxuriant oak and beech ferns. The yellow heads of *Trollius* and *Hieracium** dotted the darker background, and sea-green clumps of Rock rose clung to the grey crags. *Avena pubescens* was also observed. An equally interesting but quite different piece of ground on the other side of and below the inn, along the river-bank, will repay search. The soil is sandy, but saturated with moisture, and bears a rich herbage, amongst which *Saxifraga aizoides*, *Listera ovata*, *Gymnadenia conopsea*, and *Carex capillaris* were the most noteworthy. *Carex extensa* var. *minor*, *Blysmus rufus*, a curious and very slender form of *Juncus Gerardi*, and *Scirpus pauciflorus* grew at the margin of the river, bushy shrubs of *Rosa spinosissima* and *Populus tremula* higher up, and on all the drier banks a luxuriant growth of *Oxytropis*.

The sandy flats on the west shore of the Naver yielded abundance of *Carex incurva*, and several patches of *Juncus balticus*. At the base of the low hills which come down to the shore *Dryas octopetala*, of a peculiarly stout and vigorous growth, was holding its own, even on the wind-driven sands. A few feet higher up on the rocks were *Arabis hirsuta*, *Saxifraga oppositifolia*, *Taraxacum palustre*, *Hieracium murorum*, *Asplenium Trichomanes*, and *Cystopteris fragilis*. *Carex capillaris* was again abundant, and *Primula scotica* in a wet hollow among the hills. On the boggy slopes leading down to the Borgie *Pinguicula lusitanica*, which occurs plentifully everywhere westward, was noted for the first time, with its usual companions,

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* We hope to supplement this short paper by a few critical notes on the forms of *Hieracia*, *Euphrasia*, and *Carex vulgaris* found on this northern coast, but must defer this for the present.

Drosera rotundifolia and *D. anglica*. The drier ground was covered with juniper and *Arctostaphylos Uva-ursi*, amongst which appeared a few plants of *Draba incana* and the last of *Oxytropis*. Small marshy lochs on the moorland beyond the river produced a dwarf form of *Nymphæa alba*, *Lobelia Dortmanna*, and *Carex ampullacea*. *Potamogeton heterophyllus* and *Nitella opaca* were gathered in a little loch by the road-side, and *Pyrola minor* in woods near Tongue House.

The weather prevented much botanising on the Kyle of Tongue or Loch Erribol. The ground between the two is a low dreary moorland, and only interesting for fine views of Ben Hope and the neighbouring mountains.

Leaving Erribol, we again met with *Dryas* and *Draba* near the Smoo Cave. At the same place *Valerianella olitoria*, abundant forms of *Hieracium* (*anglicum?*), *Scolopendrium vulgare*, and *Cystopteris fragilis* were conspicuous, marking the presence of the limestone, which gives so striking a character to the flora of Durness. On hillocks by the road-side west of the Durness Inn *Thalictrum alpinum*, *Draba incana*, *Dryas octopetala*, *Rubus saxatilis*, *Hieracium cæsium*, and *Epipactis ovalis* Bab. formed an interesting group of plants, together with *Antennaria dioica* and *Botrychium Lunaria*, which are both common throughout the whole of West Sutherlandshire. In a dried-up loch at the back of the Free Church *Juncus balticus* with two or three forms of *Carex vulgaris* occurred, and in the stream flowing out of its northern end *Potamogeton filiformis* in fine fruit.

The sand-hills leading to Far-out Head are full of *Thalictrum minus* var. *maritimum* and *Viola Curtisii*. Several patches of *Primula scotica* lay in the damper hollows, and *Scilla verna* almost formed the herbage on the dry headlands. *Sedum Rhodiola*, *Silene maritima*, and *Armeria maritima* grew in every chink of the rocks, *Avena pubescens* on the grass-lands. In a wet meadow about three-quarters of a mile north of the inn we found, besides *Menyanthes trifoliata* and other marsh-loving plants, *Carex dioica*, *C. teretiuscula*, and *C. limosa*. A low range of hills bounds the limestone area on the east; on the most northern and lowest of these, Beinn Ceannabeinne, *Saussurea alpina* was growing at an elevation of scarcely 300 ft. *Arctostaphylos alpina* and *Juniperus nana* covered the summit, a few stunted plants of *Listera cordata* amongst them. In a marshy pool where the road crosses the Alt Smoo we gathered *Carex filiformis*, with *C. ampullacea* and *Lobelia Dortmanna*.

Time prevented our reaching Cape Wrath, and our next halting place was the tidy little village of Scourie, with its comfortable inn. Handa Island, which is distant about half an hour's sail, is well worth a visit, but chiefly for its magnificent cliffs and the extraordinary number and variety of the sea-birds which frequent them. We were not successful in finding any plants of much interest on the island itself; but in the neighbourhood of Scourie we gathered *Sagina saxatilis*, *Sedum anglicum* on rocks above the village, *Lobelia Dortmanna*, *Nymphæa alba*, *Scirpus fluitans*, and *Malaxis paludosa* in a small loch south of the village (marked on the Ordnance Map Leathan nan Cruichean), and on boggy ground at its head. By the road to Badcall, about half-way between it and Scourie, is Lochan Dubh, in which *Potamogeton nitens* was growing; and a few hundred yards further a piece of marshy ground, in which *Carex limosa* and *Utricularia intermedia* were abundant, the latter without a trace of flower. On rocks south-west of Scourie *Asplenium marinum* was growing scantily, *Ligusticum scoticum* and *Sedum Rhodiola* plentifully, and on crags at Badcall was *Hieracium pallidum*.

The long drive to Lairg yielded nothing of special interest. Birch-trees clothe the lower parts of the hills. *Populus tremula* and *Rosa spinosissima* cling to the rocks. A few hollies and an occasional stunted oak give variety to the higher foliage.

To those who could give longer time than our hurried tour allowed us, and could include some of the higher mountains, as Morven, Ben Hope, Foiniven, and Ben Arkle in their search, the two counties would doubtless yield many other plants of interest; but our notes are enough to show that there are few districts in Great Britain where a walk of ten days would bring within reach of the botanist so rich and varied a flora.

Appended is a list of plants observed by us, and not recorded for Caithness and West Sutherland in the second edition of 'Topographical Botany':—

108. West Sutherland.

Ranunculus Drouetii Schultz. Far-out Head.
R. bulbosus Linn.
Cardamine sylvatica Link.
Arabis hirsuta Brown. Cliffs W. of the mouth of the Naver; previously recorded from a garden wall only.
Capsella Bursa-pastoris Mœnch.
Viola Curtisii Forster. Sand-hills on Far-out Head.
Lychnis vespertina Sibth. Betty Hill.
Cerastium tetrandrum Curt. Betty Hill and Durness.
Medicago lupulina Linn.
Trifolium minus Relhan.
Alchemilla vulgaris Linn.
Geum rivale Linn.
Sedum anglicum Huds. Scourie.
Hydrocotyle vulgaris Linn.
(*Carum Carui* Linn. Very abundant on sand-hills at Melvich).
Ligusticum scoticum Linn. Scourie.
Sambucus nigra Linn.
Valeriana officinalis L. Betty Hill.
Valerianella olitoria. Smoo Cave.
Carduus palustris Linn.
Centaurea Scabiosa Linn. Sand-hills, Farr Bay.
Leontodon hispidus Linn.
Taraxacum palustre. Abundant in many places.
Crepis paludosa Mœnch. Betty Hill.
Hieracium pallidum Fries. Crags at Badcall. This is inserted with a ? in Top. Bot.
Fraxinus excelsior Linn.
Veronica agrestis Linn.
V. Beccabunga Linn. Durness.
Lamium intermedium Fries. Betty Hill, and by Loch Erribol.
Myosotis versicolor Reich. Scourie.
Atriplex Babingtonii Woods.
Oxyria reniformis Hook. Hill near Durness.
Polygonum amphibium Linn.
Fagus sylvatica Linn. Planted.
Potamogeton nitens Web. Lochan Dubh, near Scourie.
Orchis mascula Linn. Durness.
O. incarnata Linn. In several wet spots.

O. latifolia Linn.
Gymnadenia albida Rich. Melvich, Betty Hill, and Tongue.
Habenaria bifolia Bab. Man. Betty Hill.
Scilla nutans Sm. Woods at Tongue.
Luzula pilosa Willd.
L. congesta Lej.
Juncus conglomeratus Linn.
J. glaucus Sibth.
Scirpus palustris Linn.
Carex teretiuscula Good. Far-out Head.
C. glauca Scop.
C. extensa Good., b. *minor*. Mouth of the Naver.
C. eu-flava.
Digraphis arundinacea Trin.
Alopecurus agrestis Linn. Garden-weed at Scourie.
A. geniculatus Linn.
A. pratensis Linn.
Phragmites communis Trin.
Avena pubescens Linn. Durness and Betty Hill.
Festuca rubra Linn. Betty Hill.
Triticum junceum Linn. Sand-hills, Farr Bay.
Asplenium marinum Linn. Coast S. of Scourie.
Scolopendrium vulgare Sm. Smoo Cave and Scourie.
Botrychium lunaria Sw. Abundant nearly everywhere.
Equisetum sylvaticum Linn. Betty Hill and Scourie.
E. limosum Linn. Near Durness.

109. Caithness.

Nuphar pumila Sm. Loch Winless.
Barbarea vulgaris Brown.
Nasturtium officinale Brown.
Reseda Luteola Linn. Thurso.
Pyrus Aucuparia Gaert. Reay.
(*Carum Carui* Linn. Road-side E. of Thurso).
Sambucus nigra Linn. Wick, Thurso, and Reay.
Leontodon hispidus Linn. Wick and Thurso.
Taraxacum lævigatum. Near Thurso.
Hieracium vulgatum Fries. Wick and Thurso.
Rhinanthus Crista-galli Linn. Wick and Thurso.
Ulmus montana Sm. Reay.
Salix cinerea Linn. Reay.
Orchis incarnata Linn. Loch Winless and Reay.
O. latifolia Linn. Wick, Thurso, and Reay.
Scirpus uniglumis Link. By the Wick River.
Carex vulgaris Fries. Wick, Thurso, and Reay.
C. eu-flava. Wick, Thurso, and Reay.
Catabrosa aquatica Beauv. Loch Winless.

MIDDLESEX PLANTS.

By John Benbow.

The following plants, apparently not frequent in Middlesex, were gathered in the early summer of this year:—

Ranunculus parviflorus. Uxbridge and Uxbridge Moor.

Moenchia erecta. Uxbridge Common.

Trigonella ornithopodioides. Abundant on waste land west of Hounslow, near the bridge on the Staines road, with *Moenchia erecta* and *Myosotis collina*.

Valerianella auricula. Between Eastcote and Northwood (new record).

Crepis taraxacifolia. Thames side near Hampton Court (new record).—*C. biennis.* In great profusion in a meadow by Wood Hall, near Pinner; and again abundant in meadows about Harefield. Beyond doubt therefore a well-established species in Middlesex. Specimens are also occasionally met with about Iver Heath, in Bucks, a mile or two from Uxbridge.

Orchis pyramidalis. Several plants near Harefield; and sparingly on the downs near Springwell.—*O. militaris.* Several plants north of Harefield.—*O. latifolia.* Meadow near Uxbridge.—*O. incarnata.* Meadows near Drayton Ford.

Ophrys apifera. Frequent on hilly pastures about Harefield and Springwell.

Habenaria chlorantha. Several plants near Harefield. It is a curious fact that none of the Orchids reported by Blackstone and Collinson to be abundant in the old chalk-pits at Harefield, about the middle of the last century, have ever been found there since. It is noticeable also that they were all stated to be collected in this one spot only, and nowhere else in the neighbourhood. A cursory search of a few hours, however (assisted by my son and nephew), was sufficient to prove that they are not all of them extinct, as hitherto supposed, and that they are to be found, moreover, in stations beyond the area of the old chalk-pits. It is possible that others may hereafter be added to the list; for a much closer survey of the district is yet required to exhaust the chances of further discovery.

Luzula Forsteri. Pinner Wood (confirming Mr. Hind's record).

Eriophorum polystachion. Moors below Springwell Lock.

Carex paradoxa. Extremely abundant on the moors below Springwell Lock; in meadows between Denham Lock and Harefield Moor; and not infrequent by the side of ditches and canals from Denham Lock to the boundary. It grows also in the contiguous meadows of Herts. I at first concluded that this was a new record for Middlesex, but have since discovered that Mr. Warren gathered a specimen by the "canal near West Drayton," which he queried *C. paradoxa ?*, and which it undoubtedly is. A straggler had therefore found its way some five or six miles lower down the valley.

Avena pubescens. Very abundant in all the meadows round Harefield, Springwell, and Drayton Ford. It is strange that both this and the preceding, two of the commonest plants in our district, should for so many years have escaped detection. Up to the date of publication of Trimen and Dyer's 'Flora of Middlesex' there had been no record of *A. pubescens* (save as a casual in 1688). Dr. Trimen collected a specimen in 1871 from "Hillingdon Place, near Uxbridge," but this could only have been a straggler from the chalk; for, although living on the spot myself, I have never noticed it there, nor, indeed, anywhere nearer than the Harefield district, where it abounds. I gathered several plants of this species and *Bromus erectus* in the spring on the tow-path near Hampton Court;

but similarly they must have been merely waifs from some of the upper reaches of the Thames.

Kooleria cristata. Uxbridge Common.

And since the above:—

Dianthus Armeria. On rough gravelly banks of the railway between Uxbridge and West Drayton.

Polygonum mite. Near West Drayton. — *P. minus.* Shallow drains on Harefield Moor.

It will thus be seen that *Orchis pyramidalis*, *O. militaris*, *Habenaria chlorantha*, and *Avena pubescens* are happily not yet lost to the county flora.

ENUMERATIO SPECIERUM VARIETATUMQUE GENERIS *DIANTHUS;* CHARACTERES COMMUNES SECTIONIBUS INCLUDENS

Auctore F. Newton Williams.

Genus Dianthus. — Calyx tubulosus, 5-dentatus, tenuiter et æqualiter multistriatus, nervis parallelis ad quodque sepalum 7, 9, v. 11 (3 in *Proliferastro*) parte membranacea inter 5 nervorum fasciculos; bracteæ (*i.e.*, squamæ calycinæ) per paria calycem involucrum cingens, paria inæqualia. Petala 5; laminæ abrupte attenuatæ sæpius in ungues elongatos, integra multidentata v. fimbriata, rarissime retusa. Stamina 10. Torus sæpius in gynophorum stipitiformem plus minus elongatus. Ovarium uniloculare; styli 2, basi liberi. Capsula cylindrica oblonga v. rarius ovoidea, apice dentibus valvisque 4 dehiscens. Semina orbiculata v. discoidea, supra convexa, compressa, concavave parum infra, ad medium faciei interioris planæ v. concavæ umbilicata. Embryo rectus, in albumine sæpius excentricus. Herbæ perennes nonnunquam annuæ, rarius suffruticosi; ramis articulatis, teretibus v. tetragonis. Folia exstipulata, angusta graminea, sæpe glauca; marginibus scabris. Inflorescentia terminalis; flores solitarii cymoso-paniculati fasciculati v. capitati, vulgo rosei purpureive, nunc rubri, rare albi, nunquam lutei.

Subgenus I. Carthusianastrum.—Caudex annuus v. perennis; perennibus turiones decumbentes steriles emittens atque multos caules adscendentes floriferos. Inflorescentia cymoso-paniculata, v. fasciculis dichotomis v. capitulis aggregatis. Petala semper dentata. Torus parum elongatus.

Sectio Armerium, I.—Herbæ annuæ. Caules teretes. Bracteæ 2. Calyx dentibus 9–11 nerviis. Petala barbulata.

1. D. Armeria *L.*
    var. subhirsutus *Schur.*
    var. armeriastrum *Wolfn.*
    var. pseudarmeria *Wierzb.*
    var. subacaulis *Schur.*
2. D. pseudarmeria *M. B.*
3. D. corymbosus *Sib.*
    var. Poiretianus *Ser.*
4. D. tenuiflorus *Griseb.*
5. D. glutinosus *B et Hld.*

Sectio Suffruticosi, II.—Perennes suffruticosi. Inflorescentia non densa; cymis paniculatis v. fasciculis dichotomis.

Subsect. 1. Tubulosi.—Calyce apice non attenuato.

6. D. arboreus *L.*
7. D. fruticosus *L.*
8. D. pendulus *B. et Bl.*
9. D. actinopetalus *Fzl.*
10. D. elegans *d'Urv.*
11. D. Bisignani *Ten.*
12. D. virgatus *Psq.*
13. D. Bertolonii *Woods.*
14. D. juniperinus *Sm.*
15. D. aciphyllus *Sieb.*
16. D. rigidus *M. B.*

Subsect. 2.—Contracti.—Calyce apice attenuato.

17. D. Friwaldskyanus *Boiss.*
18. D. gracilis *S. et S.*
    var. pumilus *Boiss.*
    var. armerioides *Griseb.*
19. D. biflorus *Griseb.*
20. D. Mercurii *Heldr.*

Sectio Carthusianum, III.—Herbæ perennes. Inflorescentia densa, capitata. Petala nonnunquam imberbia.

Subsect. 1. Microlepides.—Caules teretes. Bracteæ lanceolatæ. Calyx dentibus lanceolatis.

21. D. trifasciculatus *Kit.*
    var. heptaneurus *Griseb.*
22. D. transsylvanicus *Schur.*
23. D. nardiformis *Jka.*
24. D. viscidus *B. et C.*
    var. olympicus *Boiss.*
    var. parnassicus *Boiss.*
    var. Grisebachii *Boiss.*
25. D. tymphresteus *Hldr. et Sart.*
26. D. trifasciculatus *Schur.*
27. D. japonicus *Thunb.*
28. D. Muschianus *B. et R.*
    var. major *Boiss.*
29. D. erinaceus *Boiss.*
    var. Webbianus *Parol.*
30. D. pinifolius *S. et S.*
31. D. liburnicus *Bartl.*
    var. ligusticus *W.*
    var. propinquus *Schur.*
32. D. cribrarius *Clem.*
33. D. calocephalus *Boiss.**
34. D. giganteus *d'Urv.*
35. D. banaticus *Henff.*
    var. biternatus *Schur.*
    var. pruinosus *Jka.*
    var. ponticus *Wahl.*

Subsect. 2. Carthusianoides.—Folia stricta. Calyx dentibus lanceolatis. Petala obovato-cuneata, barbulata.

36. D. carthusianorum *L.*
    varr. prox. 'eu-carthusianorum.'
      a. eu-carthusianorum *L.*
      b. nanus *DC.*
      c. humilis *Brügg.*
      d. vaginatus *Vill.*
    varr. prox. 'atrorubens *All.*'
      e. carmelitarum *Reut.*
      f. anisopodus *Ser. mss.*
      g. Pontederæ *Kern.*
      h. sanguineus *Vis.*
      i. atrorubens *All.*
      j. pauciflorus *Brügg.**
      k. chloæphyllus *Schur.*
      l. congestus *G. et G.*
      m. roridus *Schur.*
      n. saxigenus *Schur.*
      o. minor *Schur.*†
      p. pratensis *Ptck.*

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* 33. First European record by Pancic in Montenegro.

* *j.* pauciflorus. Engadine Valley. Near Chiavenna in Lombardy.—Fascicles of 2—6 flowers. Bracts yellow. Petals purple-red; lamina = ½ unguis.

† *o.* minor.—Leaves elongate-linear. Bracts yellow, Petals purple-red.

varr. prox. 'consanguineus.'
q. consanguineus *Schur.*
r. subfastigiatus *Schur.*
s. rupicolus *Schur.*
t. lancifolius *Schloss. et Vukot.*
u. sabuletorum *Heuff.*
v. pumilus *Schur.*
x. gramineus *Schur.*
y. ferrugineus *L.*
z. tenuifolius *Schur.*
varr. prox. 'atrorubens *Jacq.*'
α. ternatus *Schur.*
β. surulis *mihi.*[*]
γ. vaginatus *Chx.*
δ. giganteiformis *Borb.*
ε. atrorubens *Jacq.*
η. Guliæ *Jka.*
varr. prox. 'vulturius.'
θ. glaucophyllus *Wierzb.*
ι. alpestris *Balb.*
κ. parviflorus *Schur.*
λ. subalpestris *Schleich. exs.*
μ. vulturius *G. et T.*
ν. australis *Panc.*
37. D. Knappii *S. et K.*
var. rosulatus *Borb.*
38. D. ambiguus *Panc.*[†]
39. D. Schlosseri *mihi.*[‡]
40. D. pelviformis *Heuff.*
41. D. cruentus *Griseb.*
42. D. Lydus *Boiss.*
43. D. mœsiacus *Panc.*
44. D. lilacinus *B. et Hld.*
45. D. intermedius *Boiss.*
46. D. pseudobarbatus *Bess.*
47. D. barbatus *L.*
var. latifolius *Ser.*
var. aggregatus *Poir.*
var. rariflorus *Schur.*
48. D. subbarbatus *Schur.*
var. pedunculatus *Schur. hb.*
49. D. diutinus *W. et R.*
50. D. capitatus *DC.*
var. major *Griseb.*
var. minor *Griseb.*
var. Pancicianus *mihi.*[§]

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[*] β. surulis.—Leaves acicular; sheath red, four times as long as broad. Flowers 4—6 in capitullum, purple-red. Transsylvania. Herb. Kew.

[†] 38. D. AMBIGUUS.—Glabrous. Stems simple, 4-angular. Leaves elongate-linear, acuminate, plane, patent; sheath four times as long as broad. Inflorescence in dense capitula of 22—28 flowers. Bracts 4, mucronate to the apices of the calyx. Calyx purple, teeth acuminate. Petals purple-red, contiguous.

[‡] 39. D. Schlosseri, n. sp. — Glabrous. Stems terete, simple. Leaves elongate-linear, acuminate; adpressed sheath twice as long as broad. Flowers capitate. Bracts 6, obovate, mucronate to one-third the length of the calyx. Calyx purple, contracted above. Coll. Schlosser apud Janobor. Hb. Mus. Brit.

[§] Var. Pancicianus.—Glabrous. Flowers purple-red.

Subsect. 3. MACROLEPIDES.—Bracteæ 4, ovatæ, patentes.

51. D. compactus *Kit.*
52. D. crassipes *Willk.*
53. D. Girardini *Lamot.*
54. D. asperulus *B. et Huet.*
55. D. collinus *W. et K.*
var. subpaniculatus *Schur.*
56. D. hymenolepis *Boiss.*
57. D. polymorphus *M. B.*
58. D. cinnabarinus *Sprun.*
var. Samaritani *Heldr.*
var. biflorus *S. et S.*
59. D. Bitlisianus *Ky.*
60. D. pseudobarbatus *Schur.*
61. D. toletanus *B. et R.*
62. D. anticarius, *B. et R.*
63. D. stenopetalus *Griseb.*

Subgenus II. CARYOPHYLLASTRUM.—Caudex perennis, herbaceus, breves turiones steriles decumbentes, numerosos foliososque, et caules floriferos adscendentes, emittens. Flores solitarii v. gemini v. rarius cymis laxis. Petala dentata, integra, vel fimbriata. Torus elongatus in gynophorum stipitiformem.

Sectio Fimbriatum, I.—Bracteæ 4–16. Petala fimbriata.

Subsect 1.—Schistostolon.—Caules ramosi, glabri.

64. D. monspessulanus *L.*
    var. alpestris *Hpe. et Sternb.*
    var condensatus *Kit.*
    var. acuminatus *Tsh.*
65. D. marsicus *Ten.*
66. D. liliodorus *Panc.**
67. D, controversus *Gaud.*
68. D. Waldsteinii *Sternb.*
69. D. floribundus *Boiss.*
70. D. saxatilis *P.*
71. D. Sternbergii *Sieb.*
72. D. serrulatus *Desf.*
73. D. Tabrisianus *Bien.*
74. D. purpureus *mihi.* †
75. D. prostratus *Jacq.*
76. D. squarrosus *M. B.*
77. D. Zeyheri *Sond.*
78. D. Höltzeri *Winkl.*
    var. ebarbata *Winkl.*
    var. flaccida *Winkl.*
79. D. spiculifolius *Schur.*
80. D. acicularis *Fisch.*
81. D. plumosus *Spreng.*
82. D. Kuschakewiczi *Reg. et Schmalh.*‡
83. D. stramineus *B. et Hld.*
84. D. robustus *B. et K.*
85. D. oreadum *Hance.*
86. D. sinaicus *Boiss.*
87. D. valentinus *Willk.*
88. D. polylepis *Bien.*

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* 66. D. liliodorus.—A species with white flowers found in North Servia, possessing the odour of *Convallaria majalis*, according to Pancil.

† 74. D. purpureus, n. sp. — Stems slender, 4-angular. Leaves elongate-linear, acuminate, adpressed; sheath purple, as long as broad. Bracts 4, ovate, acuminate to half the length of the calyx, adpressed, stramineous. Calyx purple; teeth lanceolate-acuminate. Received at Kew from the College of Syria in 1879; found on Mount Hermon.

‡ 82. D. Kuschakewiczi.—Leaves linear, acute, flaccid, patent; sheath as long as broad. Bracts 4, outer oblong-elliptical, inner ovate-elliptical, adpressed. Calyx teeth linear, acuminate. Petals distant, beardless. Russian Turkestan.

Subsect. 2. Cycaxostolon.—Caules simplices, teretes.

89. D. graminifolius *Prsl.*
90. D. erythrocoleus *Boiss.*
91. D. atomarius *Boiss.*
92. D. fallens *Timb.*
93. D. noëanus *Boiss.*
94. D. petræus *W. et K.*
    var. pseudocæsius *Schur.*
    var. Mayeri *Prsl.*
95. D. plumarius *L.*
    var. hortensis *Schrad.*
96. D. hungaricus *P.*
97. D. arenarius *L.*
98. D. Serpæ *Hiern.*
99. D. scoparius *Fzl.*
    var. mutica *Boiss.*
    var. mucronulata *mihi.**
100. D. fimbriatus *M. B.*
    var. orientalis *Don.*
    var. obtusisquameus *Boiss.*
    var. brachyodontus *B. et Huet.*
    var. brevifolius *Boiss.*
    var. pogonopetalus *B. et K.*
    var. stenocalyx *Boiss.*
    var. brachyphyllus *Willk.*
    var. macrophyllus *Willk.*
    var. incertus *Jacqm.*
    var. angulatus *Royle.*
    var. dumulosus *B. et Huet. mss.*
101. D. catalaunicus *W. et C.*
    var. sclerophyllus *Willk.*
    var. brachyphyllus *Willk.*
    var. leptophyllus *Willk.*
102. D. gallicus *P.*
    var. lusitana.
103. D. macranthus *Boiss.*

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* Bracts orbicular, mucronulate. Calyx not contracted above.

Subsect. 3. GONAXOSTOLON.—Caules simplices, tetragoni.

- 104. D. micropetalus *E. M.*
  - var. scaber *E. M.*
  - var. glabratus *Sond.*
- 105. D. tener *Balb.*
- 106. D. serrulatus *Schloss.**
- 107. D. serotinus *W. et K.*
- 108. D. canescens *Koch.*
- 109. D. crinitus *Sm.*
  - var. tomentellus *Boiss.*
  - var. crossopetalus *Fzl.*
  - var. pubescens *Boiss.*

* 106. *Cf.* 72.

Subsect. 4. MONERESTOLON.—Caulis solitarius, unicus, ramosus, glaber. Folia patentia, recurva. Petala barbulata, non contigua.

- 110. D. libanotis *Labill.*
- 111. D. superbus *L.*
  - var. speciosus *Rchb.*
- 112. D. Wimmeri *Wich.*

Sectio BARBULATUM, II.—Flores solitarii v. cymis laxis, rosei purpureive. Petala dentata, barbulata.

Subsect. 1. LEPIDACRIBIA.—Bracteæ scariosæ, atting. $\frac{1}{4}$–$\frac{1}{3}$ calycis longitudinem.

- 113. D. lusitanicus *Brot.*
- 114. D. cæspitosus *Thunb.*
- 115. D. cæsius *Sm.*
  - var. flaccidus *Fieb.*
  - var. pulchellus *Rchb.*
- 116. D. polycladus *Boiss.*
  - var. breviberbis *Boiss. hb.*
- 117. D. multipunctatus *Ser.*
  - var. micrantha *Boiss.*
  - var. velutina *Boiss.*
  - var. striatella *Boiss.*
  - var. axilliflora *Boiss.*
  - var. subenervis *Boiss.*
- 118. D. Colensoi *mihi.**
- 119. D. zonatus *Fzl.*
- I20. D. viridescens, *Vis.*
  - var. oculatus *Boiss.*
- 121. D. microlepis *Boiss.*
- 122. D. Szowitzianus *Boiss.*
- 123. D. puberulus *mihi.*†

* 118. **D. Colensoi.**—Glabrous. Stems 4-angular. Leaves strict, adpressed; sheath as long as broad. Flowers solitary, white. Bracts 6, mucronate, adpressed. Calyx-teeth lanceolate, acuminate. Petals obovate, distant; lamina $= \frac{1}{2}$ unguis. Coast of Natal, Nelson; Herb. Kew.

† 123. **D. puberulus.**—Puberulous. Stems branched, terete. Leaves lanceolate-linear, acute, carinate, adpressed; sheath purple, twice as long as broad. Bracts 8, ovate, acuminate, adpressed, purple. Calyx purple-red; teeth lanceolate, acuminate. Petals contiguous. Haussknecht; in Hb. Kew. Luristan.

Subsect. 2. HEMISYRHIX. — Bracteæ atting. $\frac{1}{2}$ calycis longitudinem.

- 124. D. deltoides *L.*
  - var. genuinus *L.*
  - var. glaucus *L.*
  - var. microlepis *Boiss. hb.*
- 125. D. multisquamatus *mihi.**
- 126. D. gaditanus *Boiss,*
- 127. D. pubescens *S. et S.*
  - var. glabratus *Boiss.*
- 128. D. hypochloros *B. et Hld*·
- 129. D. aridus *Griseb.*
- 130. D. alpinus *L.*
  - var. pavonius *Tsh.*
- 131. D. brevicaulis *Fzl.*
- 132. D. versicolor *DC.*
- 133. D. diffusus *S. et S.*
  - var. cylleneus *B. et Hld.*

* 125. **D. multisquamatus.** — Glabrous. Stems branched, terete. Leaves linear, obtuse, plane, strict, adpressed; sheath yellow, as long as broad. Bracts 10, obovate, mucronate, purple, adpressed. Calyx contracted above; teeth lanceolate, acuminate, purple. Kurdistan, Haussknecht, 1876; in Hb. Mus. Brit.

134. D. masmenæus *Boiss.*
  var. glabrescens *Boiss.*
135. D. myrtinervius *Griseb.*
  var. subalpestris *Hpe.*
  var. oxylepis *Boiss.*
136. D. campestris *M. B.*
137. D. aristatus *Boiss.*
  var. minor *Boiss.*
138. D. humilis *W.*
139. D. Buergeri *Miq.*
140. D. nitidus *W. et K.*
  var. obtusus *mihi.**
141. D. Seidlitzii *Boiss.*
142. D. ruthenicus *Roem.*
143. D. elatus *Led.*
144. D. callizonus *S. et K.*

Subsect. 3. LONGISQUAMEA.—Bracteæ æquantes calycem longitudine.

145. D. pruinosus *B. et O.*
146. D. Seguieri *Chx.*
  var. sylvaticus *Hpe.*
  var. alpestris *Balb.*
  var. geminiflorus *Lois.*
147. D. guttatus *M. B.*
148. D. pratensis *M. B.*
149. D. suaveolens *Spreng.*
150. D. pallidiflorus *Ser.*
  var. ramosissimus *Pal.*
151. D. gelidus *S. N. K.*
152. D. neglectus *Lois.*
  var. alpinus *Vill.*
153. D. glacialis *Hnke.*
  var. subalpinus auct. varr.

Sectio CARYOPHYLLUM, III.—Caules glabri. Bracteæ adpressæ. Petala dentata, imberbia. Calyx dentibus lanceolatis. Capsula ovoidea v. oblonga, nunquam cylindrica. Semina peltata.

Subsect. 1. CARYOPHYLLOIDES.—Folia patentia. Calyx dentibus acuminatis. Capsula ovoidea.

154. D. Caryophyllus *L.*
  var. genuinus *L.*
  var. acinifolius *Schur.*
  var. binatus *Schur.*
  var. Scheuchzeri *Rchb.*
  var. collivagus *Jord.*
  var. carduinus *Ser.*
  var. divaricatus *d'Urv.*
155. D. Henteri *Heuff.*
156. D. caryophylloides *Schult.*
157. D. longicaulis *Ten.*
158. D. Boissieri *Willk.*
159. D. multinervis *Vis.*
160. D. Arrostii *Prsl.*
  var. uniflorus *Prsl.*
  var. biflorus *Prsl.*
161. D. Falconeri *Edgew.*
162. D. crenatus *Thunb.*
163. D. sinensis *L.*
  var. minor.

Subsect. 2. SYLVESTRES.—Caules tenues. Bracteæ mucronatæ. Capsula oblonga.

164. D. sylvestris.
  varr. prox. D. sylvestris, *Wulf.*
    a. sylvestris *Wulf.*
    b. brachycalyx *Huet.*
    c. pratensis *Jord.*
    d. saxicola *Jord.*
    e. juratensis *Jord.*
    f. binatus *Bartl.*
    g. bracteatus *W. et L.*
    h. ebracteatus *W. et L.*
  varr. prox. D. sylvestris, *Jacq.*
    i. sylvestris *Jacq.*
    k. Bauhinianus *Noe.*
    l. orophilus *Jord.*
    m. consimilis *Jord.*
    n. frigidus *Kit.*

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* Var. obtusus.—Leaves broader and blunter than the European species. First record in Asia in 1879. Jebel Muneitsi, Syria, 1879; Hb. Kew.

165. D. laricifolius *B. et R.*
166. D. serratifolius *S. et S.*
  var. nazareus *Clk.*
167. D. virgineus *Jacq.*
168. D. Balansæ *Boiss.*
169. D. xylorrhizus *B. et Huet.*
170. D. attenuatus *Sm.*
171. D. sabuletorum *Willk.*
  var. pyrenaicus *W. et L.*
172. D. Levieri *Borb.**
173. D. furcatus *Balb.*
174. D. siculus *Prsl.*
  var. miniatus *Huet.*
175. D. cachemiricus *Edgew.*
176. D. longiglumis *Del.*
177. D. Jacquemontii *Edgew.*

* 172. D. Levieri.—Cæspitose, glaucous. Stems branched, 4-angular. Leaves elongate-linear, acuminate, plane, patent, flaccid. Flowers rose-coloured, geminal, inodorous. Bracts 12, obovate. Near Florence.

Sectio Imparjugum, IV.—Bracteæ nunquam 4. Petala dentata vel integra, imberbia. Capsula cylindrica.

178. D. syriacus *mihi.**
179. D. Gasparinii *Gus.*
180. D. ciliatus *Gus.*
  var. racemosus *Vis.*
  var. littoralis *Hort.*
  var. cymosus *Vis.*
  var. Brocchianus *Vis.*
181. D. Kremeri *B. et R.*
182. D. aragonensis *Timb.*
183. D. multiceps *Cst.*
184. D. Costæ *Willk.*
185. D. Talyschensis *B. et Bu.*
186. D. stenocephalus *Boiss.*
187. D. repens *W.*
188. D. fragrans *M. B.*
189. D. Legionensis *W. et L.*
190. D. holopetalus *Türcz.*

* 178. D. syriacus.—Glabrous. Stems branched, terete. Leaves linear, patent, plane; sheath as long as broad. Flowers in lax panicles. Bracts 2, obovate, mucronate, patent. Calyx contracted above; teeth lanceolate, acuminate, purple. Syria, Aucher-Eloy, no. 501; Herb. Mus. Brit.

Sectio Tetralepides Leiopetala, V.—Bracteæ semper 4. Petala integra v. dentata, imberbia. Capsula cylindrica.

Subsect 1. Hispanioides.—Caules ramosi. Bracteæ atting. $\frac{1}{3}$ calycis longitudinis.

191. D. hispanicus *Asso.*
  var. australis *Willk.*
  var. borealis *Willk.*
192. D. hortus *Vill.*
  var. vivariensis *Jord.*
193. D. Requiennii *G. et G.*
194. D. cognobilis *Timb.*
195. D. albens *E. M.*
196. D. tripunctatus *S. et S.*

Subsect. 2. Sætabenses.—Caules ramosi. Bracteæ attingentes $\frac{1}{2}$ calycis longitudinis. Glabri.

197. D. Kamisbergensis *Sond.*
198. D. Planellæ *Willk.*
199. D. Andersonii *mihi.**
200. D. sætabensis *Rouy.*†
  var. minor *Rouy.*
  var. media *Rouy.*

* 199. D. Andersonii.—Stems terete. Leaves linear, acute, adpressed; sheath yellow, as long as broad. Flowers small, geminal, rose-coloured. Bracts obovate, mucronate, adpressed, stramineous. Calyx-teeth lanceolate-acuminate, purple. Syria, Kotschy, 1855; Hb. Mus. Brit.

† 200. D. sætabensis.—Cæspitose. Stems terete. Leaves linear, flaccid, plane; sheath as long as broad. Bracts mucronulate, adpressed. Petals obovate-cuneate, entire or dentate; lamina $= \frac{1}{2}$ unguis.

Subsect. 3. CINTRANI.—Caules simplices. Bracteæ mucronatæ.

201. D. elongatus *C. A. M.*
202. D. strictus *S. et S.*
var. integer *Vis.*
var. bebius *Boiss.*
var. brachyanthus *Boiss.*
203. D. procumbens *Vent.*
204. D. leucophæus *S. et S.*
205. D. virgineus *G. et G.*
206. D. micranthus *B. et Hld.*
207. D. Haussknechtii *Boiss.*
208. D. anatolicus *Boiss.*
var. parviflorus *Boiss.*
209. D. Kotschyanus *Boiss.*
210. D. cintranus *B. et R.*
211. D. insignitus *Timb.*
212. D. algetamus *Grælls.*[*]
var. Brandzæ *Kern.*
213. D. brachyanthus *Boiss.*
var. montanus *Willk.*
var. ruscinonensis *Willk.*
var. humilis *Nym.*
var. alpinus *W. et L.*
var. nivalis *W. et L.*
214. D. Langeanus *Willk.*

[*] 212. D. ALGETAMUS.—Cæspitose, glaucous, glabrous. Stems slender, terete. Leaves linear, acute, strict, carinate. Flowers geminal, rose-coloured. Bracts ovate-lanceolate, one-third the length of the calyx. Calyx purple, contracted above. Spain.

Var. Brandzæ.—Similar to above, but found in Austria; and differs in form and character of the bracts. Sched. fl. Austro-hung.

Subsect. 4. PUNGENTES.—Caules simplices. Bracteæ acuminatæ.

215. D. graniticus *Jord.*
216. D. leptoloma *Steud.*
217. D. pungens *G. et G.*[*]
218. D. serratus *Lapeyr.*[†]
219. D. acuminatus *mihi.*[‡]
220. D. sphacioticus *B. et Hld.*
221. D. lactiflorus *Fzl.*
222. D. judaicus *Boiss.*
223. D. benearnensis *Loret.*
224. D. liboschitzianus *Ser.*[§]
var. integerrimus *Bge.*
var. multicaulis *B. et Hld.*

[*] 217. D. PUNGENS of Linnæus cannot now be identified with any recognised species; neither can *D. virgineus*. *Cf.* spp. 167 and 205.

[†] 218. D. SERRATUS *Lapeyr.*—Specimens in Herb. Mus. Brit. (Fl. Helv. iii.).

[‡] 219. D. acuminatus. — Glabrous. Stems terete. Leaves linear, acute, adpressed; sheath yellow, as long as broad. Bracts lanceolate, half the length of the calyx. Calyx-teeth lanceolate, acuminate. Syria, Ancher-Eloy, no. 526; et Hort. herbaceo Kew, 1884!

[§] 224. Seringe's plant seems to be the true species.

Subsect. 5. GYMNOCALYX. — Caules ramosi. Bracteæ minutæ, scariosæ, adpressæ, 1-5th calycis longitudinis.

225. D. cinnamomeus *S. et S.*
var. pallens *S. et S.*
226. D. leptopetalus *W.*
227. D. papillosus *V. et P.*
228. D. sulcatus *Boiss.*
229. D. subacaulis *Vill.*

Subgenus III. PROLIFERASTRUM.—Herbæ annuæ. Flores capitati. Bracteæ 2. Calyx 15-costatus, apice attenuato. Petala retusa. Torus parvus. Capsula oblonga.

230. D. Cyri *F. et M.*
231. D. glumaceus *B. et C.*
232. D. obcordatus *R. et M.*
233. D. prolifer *L.*
var. scabrifolius *Clar.*
var. lævis *Clar.*
234. D. velutinus *Guss.*
var. Sartorii *Frhl.*

DeCandolle genus DIANTHUS in duas partes sectionesve dividit, quibus nomina *Armeriastrum* et *Caryophyllum* imposuit. Sectio prior species floribus capitatis v. corymbosis, altera species floribus paniculatis v. solitariis præditas continet. Ad Armeriastrum DeCandolle Dianthum etiam proliferum speciesque affines retulit, quas postea Kunth a genere separavit atque in genus proprium, *Kohlrauschia* dictum, conjunxit. Quæ separatio non approbanda est, quod forma et structura capsulæ seminumque, imo habitus illarum specierum cum Dianthis genuinis omnino seminumque congruunt. Nihilominus D. prolifer speciesque consanguineæ ad sectionem Armeriastrum referri non possunt, propterea quod in iis structura calycis, squamarum calycinarum, et petalorum a structura, quam hæc organa in Armeriastris genuinis possident, magnopere differt. Quam obrem sectionem propriam constituant necesse est. Genus etiam *Tunica* a Scopoli creatum, quod D. saxifragum speciesque ei affines, continet cum genere Kohlrauschia conjunctum est, quod nominatum Pseudodianthus formare, genere seniore continente, Dianthus (v. Eudianthus), priores sectiones Armeriastrum et Caryophyllum. Utrumque genus sic dictum dua in subgenera dividendum est, et quidem Pseudodianthus in subgenera *Tunica* et *Kohlrauschia;* Eudianthus in sectiones *Armeriastrum* et *Caryoyhyllum.* Sunt quidem species inter Armeriastrum (v. quo nunc nomen subgenericum *Carthusianastrum* imposui) et Caryophyllum (nunc subgenus *Caryophyllastrum*)—v. c. D. toletanus, graniticus, et Seguieri, sed pleræque utriusque sectionis species typum sectioni peculiarem possident, quam ob causam sectiones illæ conservandæ sunt. Subsectiones formatæ ob marginem petalorum limbi bonæ sint, subsectiones formatæ autem præterea ob squamarum calycinarum (bractearum) configurationem pariter naturales videntur. Hæc distinctio in forma squamarum calycinarum, subsectionibus *Macrolepides* et *Microlepides* nomina imponunt. In Dianthis latisquamis latitudo squamarum longitudinem fere æquat, in angustisquamis longitudo latitudinem multo superat. Species latisquamæ v. Macrolepides squamas breves obtusas v. ex apice obtuso breve aut in mucronulum possident; species angustisquamæ v. Microlepides autem squamis longis acutis v. acuminatis v. plus minus sensim in mucronem aut aristam productis præditæ esse solent. Dianthi latisquami petala integra v. dentata, rarius fimbriata, angustisquami petala dentata aut fimbriata, raro integra possident. Etiam verum est observatione, quidem attamen concedendum est, petala integra et fimbriata, item petala dentata et fimbriata in una eademque specie non occurrere. Quibus principiis, ergo, cum aliis, qualis dispositione appositioneque inflorescentiæ, classificatio naturalis exsequatur.

Nomina trium subgenerum tribus speciebus typicis fundantur, videlicet:—

Carthusianastrum, Caryophyllastrum, et Proliferastrum (=Kohlrauschia). Species omnes in herbariis in Museo Historiæ Naturalis, Cromwell Road, et collectionum Kewensium, specimina omnia viventia in Hortis Kewensibus collocata in Horto Herbaceo, multa specimina recenter decerpta, iconibus et descriptionibus publicatis, materiem huic enumerationi præbuerunt.

Addenda.

In diagnosibus 3 subgenerum insere :—

I. "Folia bracteiformia sub floribus densa. Calyx subcylindricus."

II. "Nullis foliis veris bracteiformibus. Calyx cylindricus valde costatus præsertim superne."

III. "Folia bracteiformia sub floribus laxa. (Calyx, apice) pentagono."

24. Adde var. alpinus *Boiss.*

36. Var. australis (recenter distinctius descriptam) post var. saxigenus transfer.

* 113. **D. lusitanoides** mihi.—Cæspitose, glabrous. Stems 48 centim., branched, terete. Leaves radical, linear, acute; cauline elongate-linear, acuminate, strict, adpressed; sheath as long as broad. Bracts 4, obovate-lanceolate, mucronate, adpressed. Calyx-teeth lanceolate, acuminate, purple, 9-nerved. Petals obovate, rose-coloured.—Palestine Exploration Society; east of the Jordan. Herb. Kew.

146. Lege var. sylvaticus *Koch.*

233. Adde var. subuniflorus *mihi.*—Transsylvaniæ, Herb. Mus. Brit.

SHORT NOTES.

Epilobium Lamyi F. Schultz in Worcestershire.—I gathered specimens of this plant from an arable field near Malvern a few weeks ago. It was growing in great abundance, but, owing to most of the plants having their lower leaves much withered, it was impossible to procure good examples. Mr. Ridley, who has seen some of the specimens, suggests, with great probability, that when it is better known it will prove to be much more common than is usually supposed. It may easily, before the development of the rosettes, be passed over for *obscurum*, and later, when the leaves of the stem become withered and the rosettes apparent, for *tetragonum*. It is, however, a smaller plant than either. Possibly, if herbarium specimens labelled "*obscurum*," yet wanting the long styles, were examined, some might prove to be this species.—R. F. Towndrow.

Astragalus alpinus in Forfarshire (p. 310).—With reference to Mr. Brebner's remark on the Glen Dole station, I may say I have specimens gathered by Dr. Greville in 1837, and others gathered by the late Mr. Sadler in 1872 "on Craig Maid, Glen Dole."—Arthur Bennett.

NOTICES OF BOOKS.

English Botany. Ed. iii., pts. 87–8. [1884–5]. London: Bell & Sons. 5*s.* each.

These last two parts of 'English Botany' contain the account of the *Characeæ.* Dr. Boswell, owing to ill-health, was unfortunately unable to add the finishing touches to the description of this order, and Mr. N. E. Brown, of Kew, has been entrusted by the publishers with seeing it through the press.

The species are described under the two genera *Chara* and *Nitella*, *Tolypella* and *Lychnothamnus* being treated as sections. Dr. Boswell has taken the "lumping" view of these plants, describing nineteen species and reducing to the rank of varieties several which are usually regarded as species, such as *Nitella capitata*, *Tolypella prolifera*, and *Chara polyacantha*. The descriptions are drawn up in Dr. Boswell's usual careful manner, and it is much to be regretted that the completion of the work has necessarily fallen into other hands. A number of additions have been made by Mr. N. E. Brown, many of which are unnecessary or erroneous; indeed, most of the sentences of any length included in square brackets contain one or more blunders. This might have been excused in one having no previous knowledge of the group had it not been for the dogmatic and authoritative tone adopted. The off-hand manner in which the conclusions of the greatest authority on the order, the late Alex. Braun, are dismissed would certainly be amusing, as showing what intense egotism can produce, were it not for the discredit thereby brought upon British Botany; for instance, under *N. nidifica* Mr. Brown did not happen to see the difference between plants which Braun had distinguished, so he had no doubt Braun was wrong, and wrote, "The nucules examined by Braun must have been quite immature ones." As if Prof. Braun did not know unripe nucules when he saw them!

The trustworthiness of Mr. Brown's work may be gathered from the remarks under *C. fragifera*, p. 217, where, after referring, in a footnote, to our notice of a monœcious state, and saying that he had not seen a specimen, he unhesitatingly states of the globules, "Rarely on the same plant, and placed immediately beneath the nucule." Now, as he professes to rely on our statement as to the existence of a monœcious state, his description of the position of the globules (which happens to be quite erroneous as regards our specimen) must be purely conjectural. Again, under *N. glomerata* var. *Smithii*, he writes:—"I have very carefully examined Mr. Borrer's Lancing specimen, and only find globules upon it, not a trace of a nucule: this is therefore, I have no doubt, another case of a polygamous species, as in that of *N. flexilis*." Now, any one in the habit of examining *Characeæ* should have had no difficulty in finding young nucules on that specimen. We first have an inexcusable blunder, and then one of those generalisations which seem to come so naturally to the careless observer. We will cite but one more passage, p. 216:—"*C. connivens* appears to be but a sexual state of *C. fragilis*, as strictly it only differs from that plant in sex." Comment on this would be superfluous.

Twenty-three plates are given, some of which are noticeably good, especially some of the *Tolypellæ*, though the spreading habit of *T. prolifera* is not well shown; the old reproduced plates, however, are not at all creditable, and one or two of the new ones do not give at all a good idea of the plants. We regret that publishers of the standing of Messrs. Bell & Sons should omit to date their publications.

H. & J. Groves.

Although hardly a botanical book, the 'Dictionnaire des Roses,' lately issued by M. Max Singer (Berlin, Parey: 2 vols. 8vo), is noteworthy, as adding to the name of each variety the authority and date of publication: thus, "Adolphe Brogniard, Margottin, 1869." About six thousand garden roses are passed in review, the characters of each being given. The introductory section, devoted to "races et espèces anciennes," is of more than horticultural interest.

New Books.—M. Colmeiro, 'Enumeracion y revision de las Plantas de la Peninsula Hispano-lusitana é Islas Baleares: Tomo 1: Preliminares y Talamifloras' (Madrid: 8vo, pp. ccvii, 595).—A. De Vos, 'Flore complète de la Belgique' (Mons, Manceaux: 8vo, pp. xxiii, 741).—F. A. Fluckiger & A. Tschirch, 'Grundlagen der Pharmacognosie' (ed. 2: Berlin, Springer: 8vo, pp. viii, 257: 186 cuts).—F. Elsner, 'Unsere Nahrungs- und Genussmittel aus dem Pflanzenreiche sowie deren Surrogate und Verfälschungsmittel' (Halle, Knapp: long fol. [pp. 26], tt. 10).—T. Caruel, 'Flora Italiana,' vol. vi. pt. 2 (Corollifloræ: Firenze, Le Monnier: 8vo, pp. 337–656).—G. Lahm, 'Zusammenstellung der in Westfalen beobachteten Flechten' (Munster, Coppenrath: 8vo, pp. 163).—J. Bel, 'Nouvelle Flore du Tarn et de la Région Toulousaine' (Albi, Amalric: 8vo, pp. lix, 371).—A. De Bary, 'Vorlesungen über Bacterien' (8vo, pp. 146, figg. 18: Leipzig, Engelmann).—C. Bicknell, 'Flowering Plants and Ferns of the Riviera' (London, Trübner: large 8vo, tt. 82, with letterpress).— — 'Bible Flowers and Flower-lore' (London, Hodder & Stoughton: 8vo, pp. viii, 151, 1s. 6d.).—Grant Allen, 'Charles Darwin' ('English Worthies' Series: London, Longmans: 8vo, pp. viii, 206, 2s. 6d.).—V. Hehn (ed. J. S. Stallybrass), 'The Wanderings of Plants and Animals' (London, Sonnenschein: 8vo, pp. 523).

Articles in Journals.

Ann. Mag. Nat. Hist. (Oct.).—R. Kidston, 'Relationship of *Ulodendron*,' &c. (concluded).

Botanical Gazette (Sept. & Oct.).—J. C. Arthur, 'Proof that Bacteria are the cause of Pear Blight.'—W. F. Farlow, 'Notes on injurious Fungi of California.'—C. R. Barnes, 'Fertilisation of *Campanula americana*' (1 plate).—D. H. Campbell, 'Development of Prothallia of Ferns' (1 plate).—J. M. Coulter, 'Appearance of relation of ovary and perianth in development of Dicotyledons.'—G. Vasey, 'Plants of Greely Expedition' (Grinnell Land: *Puccinia Cheiranthi* Ellis & Harkn., sp. n.).

Bot. Centralblatt (Nos. 31, 32).—H. Solereder, 'Zur Anatomie und Systematik der Combretaceen.' — (No. 33). J. Brunchorst, 'Zur Frage über den sogenannten Galvanotropismus.'—(No. 34). A. Hansgirg, 'Anhang zu Polymorphismus der Algen' (2 plates). —(No. 35). N. Wille, 'Ueber Chromulina-Arten als Palmella-stadium bei Flagellaten.'—(No. 36). H. Zukal, 'Epilog zu meinen "Flechtenstudien"' (1 plate).—(No. 37). J. B. Schnetzler, 'Vorläufige Notiz über ein Moos des Genfersees.' — (No. 38). H. Karsten, '*Exobasidium*.'—J. Macleod, 'Untersuchungen über die Befruchtung einiger phanerogamen Pflanzen der Belgischen Flora.' —(No. 41). D. Mahlfert, 'Beitrage zur Kenntniss der Anatomie der Laubblätter der Coniferen' (2 plates).

Bot. Zeitung (Sept. 25-Oct. 16). — J. Grabendörfer, 'Beiträge zur Kenntniss der Tange' (1 plate). — (Oct. 16). F. Noll, 'Ueber rotirende Nutation an etiorliten Keimpflanzen.'

Bull. Torrey Bot. Club.—T. Meehan, '*Pinus edulis* and *P. monophylla*.'—(Aug.). Id., *Verbascum Lychnitis.* — W. R. G. [Gerard], 'The Indian Peach.'

Garden (Oct. 17).—*Podalyria sericea* (ic. pict.).

Gardeners' Chronicle (Oct. 3). — *Pescatorea Ruckeriana* Rchb. f., n. sp.—N. E. Brown, 'Cleistogamous Flowers,'—Id., 'Fertilisation of *Hoya*.' — G. S. Jenman, 'Proliferation in Ferns.' — A. D. Webster, 'Fertilisation of *Arum crinitum*.' — (Oct. 10). 'Edmond Boissier' (d. Sept. 25).—W. G. Smith, '*Agaricus rubescens*' (figs. 57, 98).—G. Nicholson, 'Yellow Roses' (figs. 100, 101).—(Oct. 17). *Dendrobium Parthenium* Rchb. f., *Masdevallia senilis* Rchb. f., spp. nn. — C. B. Plowright, Woolhope Club Excursion. — (Oct. 24). Benedict Roezl (portrait). *Clematis Davidiana* (fig. 120).

Nuovo Giorn. Bot. Ital. (Oct.).—O. Mattirolo, 'Sullo sviluppo e sulla natura dei tegumenti seminali sul genera *Tilia*' (3 plates).— L. Macchiati, 'Contribuzione alla flora biologica dei dintorni di Cuneo.'

Oesterr. Bot. Zeitschrift (July). — C. Schiedermayr, 'Robert Rausscher' (b. 26 July, 1806: portrait).—D. Hirc, 'Zur Flora von Croatien.'—E. Formánek, 'Flora des böhmisch-mährischen Schneegebirges.' — P. G. Strobl, 'Flora des Etna' (new vars. of *Stellaria media*). — (Aug.). E. Preissmann, 'Zur Flora von Steiermark.'— (Sept.). A. Kornhuber & A. Hiemerl, *Erechthites hieracifolia* (in Europe). — H. Braun, '*Rosa Wettsteinii*, sp. n.' — V. v. Janka, '*Syringa Josikæa*.' — J. Ullepitsch, '*Alyssum Heinzii* mihi?' — P. Ascherson 'Zur Flora Sardiniens.'—(Oct.). J. Wiesbaur, 'Rosenflora von Travnik.' — E. Formánek, 'Bildungsabweichungen' (*Galanthus nivalis*). — V. v. Borbás, '*Polygala Chamæbuxus* in Ungarn.'

Pharmaceutical Journal (Oct. 10.)—J. M. Macfarlane, 'Pitchered insectivorous plants: a chapter on evolution.'

NOTES ON SOME PLANTS FROM NORFOLK ISLAND.

By Baron Von Mueller, K.C.M.G., M.D., Ph.D., F.R.S.

Last year, when offering to this Journal the description of *Asplenium Robinsonii*, (pp. 289–290), I had occasion to refer also to *Pterocarpus australis* from the same locality as likely belonging to *Wistaria* or *Millettia*, which two genera might well be combined. This supposition has proved to be correct, because Mr. Isaac Robinson has succeeded after much search to find of the large climber, assigned by Endlicher to *Pterocarpus*, at last a single fruit, which is completely in accord with *Millettia*, as will be seen from the following notes:—

Pod (the only one seen) ellipsoid, turgid, ending gradually into an almost subulate apex, tapering also at the base, tardily and imperfectly dehiscent, glabrescent and brownish outside, including the apex, 3½ in. long, nearly 1½ in. broad; valves hard, thick, almost lignescent; cavity divided by cross-partitions between the seeds, invested by a whitish fibrous membrane. Seeds only two ripened, measuring ¾–1 in., almost globular, but next to the septa more or less truncate, yellowish brown, smooth; hilum much elongated, linear; testa coriaceous, pallid inside; embryo emitting a strong odour, when dry of horny hardness, whitish fresh, turning livid; cotyledons nearly equal; radicle about ⅛ in. long, ellipsoid, placed obliquely, only a small portion emerging beyond the cotyledons. Several ovules remain undeveloped, therefore the fruit may ripen sometimes more than two seeds.

Thus we have also now become aware that *Millettia australis* approaches closely *M. megasperma*; the leaflets are, however, almost blunt, and reticulated by more prominent veins; the stalklets of the flowers are shorter, the bracts narrower, the calyx-lobes shorter and less pointed, the pod produced is into a longer apex, and not velvety outside. It may, however, here be mentioned that the late M. de la Camera insisted on the occurrence of two kinds of *Wistaria* on the Richmond River, one with pods nearly glabrous outside, containing more numerous seeds of hardly half the size of those of the true *M. megasperma*. He found this *Wistaria*—which, in memory of his zealous collecting efforts in the primeval forests of East Australia, I wish to call as a species or variety *Millettia* or *Wistaria Camerana*—to climb up to a height of eighty feet or even more; the flowering specimens from the Richmond River show also considerable differences of the length of the calyx-lobes, which may indicate specific discrepancies.

While offering these remarks on a long-misunderstood plant of Norfolk Island, it may here not be out of place to note that the great fern investigator, Mr. J. G. Baker, refers to *Asplenium Robinsonii* as the doubtful recorded variety of *A. squamulatum* of Hooker's Spec. Filicum, iii. 83, the origin of which had remained for very many years obscure; this particular fern, now shown to be a native of Norfolk Island, is evidently not identical with Blume's

A. squamulatum of Java, Borneo, and the Philippine Islands, but probably endemic to the far-isolated oceanic spot as a remnant of a bygone vegetation, where indeed it is now nearly extinct, as trading horticulturists have carried away three of the only five individual plants known from various spots of the island. Mr. Robinson writes concerning this fern, that in habit it is not unlike *A. Nidus*, so that four fronds gathered from one plant could scarcely be missed, and that all fronds appeared fructified, yet it shows no inclination for natural dispersion ; specimens lately received exhibit the spikes semiterete and channelled, and the apex of the frond acute.

In Endlicher's list and Cunningham's addition of Norfolk Island plants is not contained *Melicytus ramiflorus*, a plant all the more interesting from thence, as it seems nowhere represented by any congeneric form in the flora of Continental Australia. As regards the *Olea* from Norfolk Island, it might be now incidentally remarked that it should be distinguished as *Olea Endlicheri*, inasmuch as Vahl described in the Symbolæ, iii. 3, his *Olea apetala* from New Zealand.

Herr Stephani and Dr. Cooke have been so good as to name the *Hepaticæ* and Mosses, hitherto sent by Mr. Robinson from Norfolk Island, as follows :—

Anthoceros lævis Linné.
Bryopteris vittata Mitten.
Plagiochila Sinclairii Mitten.
Lophocolea ciliata Stephani.
Omphalanthus convexus Stephani.

To which is to be added the common *Marchantia polymorpha* Linné.

Hymenochæte purpurea C. & M.
Tremella lutescens Fries.
Polyporus australis Fries.
P. hirsutus Fries.
Stereum lobatum Kunze.
Daldinia vernicosa Fries.
Thelephora caperata Berkeley.
Xylaria Schweinitzii Berkeley.
Hypocrea fusaroides Berkeley.

To which are to be added : *Polyporus sanguineus* Meyer, *Hirneola Auricula-Judæ* Fries, and a species of *Aseroe.*

Melbourne, October, 1885.

PROTOPLASMIC CONTINUITY IN THE *FUCACEÆ.*

By Thomas Hick, B.A., B.Sc.

Part II.

The following notes and observations are a continuation of those embodied in a paper on the above subject which appeared in a recent issue of this Journal.* They should, indeed, have formed part of that communication, but their publication was unavoidably postponed.

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* April, 1885.

HIMANTHALIA LOREA Lyngb.

The stalked, funnel-shaped thallus of this "weed," with its coriaceous fruit-body divided dichotomously into thong-like branches, is a well-known inhabitant of British coasts. In its mode of reproduction and general structure it closely agrees with the *Fucaceæ* already dealt with, and with which systematists usually associate it. The thallus is composed of Epidermal, Cortical and Central or Medullary tissues, though there is no sharp line of distinction between them. Save in the presence of the conceptacles bearing antheridia or oogonia, the reproductive part, which constitutes by far the major portion of the thallus, has substantially the same structure as the sterile part.

The *Epidermal tissue* is composed of several layers of cells, often so connected with one another that the cells of each layer appear to arise by the dichotomous branching of those of the next inner layer. The cells of the outermost layers have their longest diameter perpendicular to the surface of the thallus, and their narrow, oblong, or wedge-shaped protoplasts forcibly remind one of the columnar epithelium of animal mucous membranes.

The *Cortical tissue* is a thick parenchymatous mass, whose constituent elements vary in size and shape, and in the thickness of their walls. Small where they abut on the epidermal tissue, they become longer and stretched in the longitudinal direction, towards the interior, and finally pass over somewhat abruptly into the filaments and fibres which constitute the central tissue. The protoplasts are irregular in shape, and send out radiating pseudopodia-like processes in various directions. Transverse and longitudinal sections show that the cell-walls are more strongly thickened in the middle region of the cortex than in the inner and outer portions.

The *Central tissue*, like that of other Fucoids, is composed of cellular, filamentous structures, which originate, at least in part, as outgrowths from the cortical cells. These are loosely interwoven longitudinally and transversely, though the great majority run in the former direction. Two kinds may be distinguished, *viz.*, filaments proper and fibres. The former are stouter, have more homogeneous walls, and more watery protoplasmic contents. Their articulations are provided with a thick annular ingrowth, which surrounds the transverse partitions where such are present. A constriction of the outer surface, at irregular intervals, is a common phenomenon in these filaments. The fibre-like structures are finer, and have very dense protoplasmic contents, while their walls are longitudinally laminated. At intervals, which are sometimes considerable, are placed transverse septa, which are extremely oblique, the fibres in this, as in other characters, resembling the fibres described and figured in *Ascophyllum nodosum*.* Both filaments and fibres branch more or less freely, but the former are not connected with each other by lateral diverticula, as are those of the plant named.

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* *Loc. cit.*, p. 99.

In examining these tissues for evidences of the continuity of the protoplasm, great difficulties have been met with, greater even than those encountered in the *Fuci*. Hence the results, though conclusive as to the existence of continuity in the central and cortical tissues, are not quite demonstrative as to its permanence, nor as to its extension over the whole thallus. The methods employed for preparing sections for examination were those already described in detail, swelling and clarifying reagents being absolutely indispensable.

In good sections prepared by these methods, stained, &c., the following details may be made out with tolerable ease:—

1. The protoplasm of the filaments, fibres, and cortical cells is certainly interrupted, in many cases, at the transverse partitions, longitudinal contraction of the proloplasts having at least equalled that in other directions.

2. In other cases, however, there are indisputable phenomena of continuity conforming to at least two of the types met with in *Ascophyllum nodosum*. Thus in the filaments and fibres of the central tissue, as well as in the cortical cells, many instances are met with in which the continuity is brought about directly by a comparatively stout undivided cord of protoplasm. Others are to be found, though scarcely more frequently, in which continuity is effected by means of a sieve plate, in which case the pores are either scattered over the whole plate or restricted to its margin. There are also cases which give rise to the suspicion that continuity is sometimes maintained by a single, central, attenuated, thread of protoplasm, but a perfect demonstration of this can hardly be said to have been obtained.

With regard to the epidermal tissue, it must be admitted that decisive preparations either for or against continuity are still a desideratum. The best sections hitherto obtained seem to point to previously existing connecting threads running from protoplast to protoplast, but in none of them have such threads been found intact. It may be that the modes of treatment are too rough for such delicate structures as these, but in any case this point will require further investigation.

From what has been stated it will be obvious that in *Himanthalia lorea* the arrangements for continuity are either not so universal or not so permanent as in the *Fuci*, or else they are more easily destroyed. Taking all the circumstances of the case into careful consideration, and giving due weight to the appearances presented by the sections, even where the continuity is interrupted, the writer regards the last of these possibilities as by far the most probable one.

LAMINARIA DIGITATA Lamx.

Though not usually classed with the *Fucaceæ*, *Laminaria digitata* may be dealt with here, seeing that in histological structure and the phenomena of continuity it exhibits, it bears some resemblance to the forms already considered.

Sections through the thallus show that, both in the rounded stipes and the flattened lamina, the tissues may be described as epidermal, cortical, and medullary or central, though the aspect of these is not quite the same as the tissues so named in other forms. In the stipes the epidermal tissue consists of several layers of small cells, placed in rows vertically to the surface. The cortex is unusually thick, and is formed of cellular elements with greatly thickened walls, while the medullary tissue is reduced to a thin central band. The lamina presents the same series of tissues, but the epidermal layers are not so numerous. In both portions the central tissue is made up of branched filamentous structures, which run longitudinally, closely interwoven with others of a more fibrous character, which, for a part of their course at least, run transversely.

To observe the phenomena of continuity presented by sections of these tissues recourse must be had to the most effective reagents for swelling, clarifying, and even partially dissolving the strongly-thickened walls of the histological elements. In sections successfully treated with these ends in view, it is not difficult to make out an elaborate system of connections between the protoplasts, both in the central and the cortical tissue. The type of continuity here presented is chiefly, if not exclusively, that which is maintained through the intervention of a sieve-plate. The protoplastic contents of the central structures are for the most part reduced to comparatively small threads, but at the transverse partitions they dilate to the full breadth of the plate. In some cases the whole plate is traversed by the connecting threads, but in others the connections appear to be altogether peripheral.

The protoplasts of the cortex are rhizopod-like masses, with pseudopodia spreading in such a manner that the cells of each layer are brought into connection both with one another and with those of adjacent layers. As in the centre, continuity is effected through the intervention of sieve-plates, the whole or merely the periphery of which may be traversed by the protoplasmic threads.

As in the case of *Himanthalia lorea*, the presence of continuity in the epidermal tissue is still doubtful, though appearances are suggestive of it. The fact remains, nevertheless, that in spite of many efforts to make a suspicion a certainty, a demonstrative case has not yet been met with.

FLINTSHIRE PLANTS NOT RECORDED IN ED. 2 OF 'TOPOGRAPHICAL BOTANY.'

By Robert Brown.

Although the county of Flintshire in North Wales is of small extent, the Flora is varied and extensive. Including the estuary of the River Dee, it possesses a considerable amount of sea-coast, and its geological features are of much interest. Limestone is often present, so many plants are found peculiar to this formation.

The highest ground is Moel Fammau, 1823 feet above the sea, half of the mountain only being in this county.

The following plants, which I have observed growing in Flintshire, are not recorded in the 2nd edition of 'Topographical Botany':—

**Clematis Vitalba* L. A few bushes nearly one mile south of Caergwrle, just before reaching the boundary of Denbighshire. Most probably introduced.

Ranunculus Drouetii Schultz. In the stream flowing from Ffynnon Asaph, about a quarter of a mile towards Diserth.

Papaver hybridum L. Queried. Formerly abundant on waste ground on the east side of Rhyl, especially near the Cemetery, and by the footpath leading to the Diserth Road. Now nearly extinct, owing to building operations and the making of Gladstone Road.

Fumaria pallidiflora Jord. Sparingly by footpath from centre of Prestatyn towards Rhyl.

Cardamine sylvatica Link. In the neighbourhood of Nannerch, also about Prestatyn. Doubtless frequent.

Cochlearia danica L. Abundant on sandy hedge cops on the sea side of the railway-station at Prestatyn, towards Rhyl.

Viola Reichenbachiana Bor. On limestone in the Leete or Alyn Valley, about one mile west of Rhydymwyn Railway-station.

Polygala depressa Wend. On the slope of Coed yr Esgob, about one mile and a half south of Prestatyn, and high ground at Nannerch. Doubtless frequent.

Euonymus europæus L. In the Leete or Alyn Valley, about three miles south-west of Rhydymwyn Railway-station.

Astragalus glycyphyllus L. Sparingly on the slope of Coed yr Esgob, nearly two miles south of Prestatyn.

Callitriche platycarpa Kutz. In the stream flowing from Ffynnon Asaph, about a quarter of a mile towards Diserth.

Œnanthe crocata L. Ditches between Diserth and Rhuddlan, and also between Diserth and St. Asaph.

†*Smyrnium Olusatrum* L. Field below a farmhouse called Tan yr allt, base of the hill south of Prestatyn. Abundant about Meliden, especially in lane leading to Pwll y bont; also in woods at Nant, about half a mile east of Prestatyn. Although so plentiful in the neighbourhood, most probably originally introduced.

Cornus sanguinea L. Abundant on the slope of Coed yr Esgob, one to two miles south of Prestatyn, also in hedgerows about Meliden. In the neighbourhood of Caergwrle.

Dipsacus pilosus L. Queried. Banks of the river, mostly on the west side, between Rhuddlan and St. Asaph.

**Onopordum Acanthium* L. Among the ruins of Rhuddlan Castle.

Serratula tinctoria L. Slope of Coed yr Esgob, about one mile and a half south of Prestatyn. In the Leete or Alyn Valley, about three miles south-west of Rhydymwyn Railway-station.

Anthemis Cotula L. Cornfields at Prestatyn.

Convolvulus Soldanella L. Loose sandhills about one mile and a half west of Prestatyn; also on the sandhills at the east extremity of Rhyl.

Atropa Belladonna L. Reported as ill vouched. Formerly in some quantity about two and a half miles west of Mold, near where a road branches off from the Ruthin Road to Trinity Church. Owing to quarrying operations very few plants remain.

Verbascum Lychnitis L. Hedgebanks west of Caergwrle.

**Veronica Buxbaumii* Ten. A weed in Mold Railway-station in 1884, and in the same year by the roadside a short distance west of Nannerch.

Atriplex Babingtonii Woods. Seashore at Prestatyn.

Habenaria chlorantha Bab. Sparingly on the slope of Coed yr Esgob, about two miles south of Prestatyn.

Epipactis latifolia Auct. East side of Maes mynan Glen, near Caerwys, just in Flintshire, the Denbighshire border being close at hand.—*E. ovalis* Bab. Limestone *débris*, base of Talargoch Hill, about three miles south of Prestatyn. Only sparingly scattered.

Zannichellia pedicillata Fries. Sluggish brook immediately west of Prestatyn. Ditch by the River Elwy at Rhyl. Pool near the summit of the hill behind Prestatyn by Pen yr allt, towards Gwaunysgeor.

Juncus Gerardi Lois. Salt marsh at Rhyl and Prestatyn.

Scirpus pauciflorus Lightf. Damp hollow among the sandhills west of Prestatyn.

Carex disticha Huds. Salt marsh east of Prestatyn.—*C. muricata* L. Hedgebank east side of lane ascending the hill a short distance beyond the Cross Foxes, Prestatyn. Roadside about one mile west of Ffynnon Grovw. In narrow lane ascending the hill by the Signal-station, between Prestatyn and Gronant.—*C. divulsa* Good. Hedgebank near a farm called "Bryn," between Ffynnon Grovw and Glan yr afon.—*C. stellulata* Good. East slope of Moel y parc, very near the border of Denbighshire.—*C. remota* L. Abundant between St. Asaph and Cwm.—*C. axillaris* Good. Scattered between Bryn hyfryd, about one mile beyond St. Asaph and Cwm.—*C. ovalis* Good. Hill ground above the Signal-station between Prestatyn and Gronant.—*C. præcox* Jacq. Hill ground at Caergwrle. In the Leete or Alyn Valley south-west of Rhydymwyn Railway-station. Slope of Coed yr Esgob, one mile and a half south of Prestatyn.—*C. pallescens* L. Wood between Rhydymwyn Railway-station and Moel y Gaer.—*C. sylvatica* Huds. Wood between Rhydymwyn Railway-station and Moel y Gaer. Slope of Coed yr Esgob, about one mile and a half south of Prestatyn.—*C. lepidocarpa* Tausch. East slope of Moel y parc, very near the border of Denbighshire. Wood between Rhydymwyn Railway-station and Moel y Gaer.—*C. Œderi* Ehrh. Hollow in sandhills near the old Vitriol Works, Prestatyn.—*C. paludosa* Good. Wood between Rhydymwyn Railway-station and Moel y Gaer. Damp ground near Nannerch. Marshy fields west of Prestatyn.

Phleum arenarium L. Sandy ground on the sea side of the Railway-station at Prestatyn.

Ceterach officinarum Willd. Old wall east of Caerwys.

Polypodium Phegopteris L. East side of the dell at Maes mynan, near Caerwys, just in Flintshire, the boundary of Denbighshire being close at hand.

Equisetum palustre L. Sandhills between Prestatyn and the Point of Air.—*E. limosum* L. Low ground below Meliden.

THE FORSTER HERBARIUM.

By James Britten, F.L.S.

The acquisition by the Kew Herbarium of some of the plants collected by the Forsters in the latter half of the last century was made the text of an interesting article by Mr. Hemsley in 'Nature' for Sept. 24. The article, however, seemed to me to require supplementing, inasmuch as Mr. Hemsley gave a somewhat erroneous impression as to our previous knowledge of these plants. I therefore wrote to 'Nature,' pointing out certain particulars which I thought should be placed on record. The Editor declined to insert my letter, and I print it here.*

Mr. Hemsley's article is as follows :—

"Botanists will learn with pleasure that this herbarium, a portion of the collections of Cook's second voyage, has been acquired by exchange from the Liverpool Corporation for the Kew Herbarium; and it will be incorporated in the general collection. From the introduction to the 'Catalogue of Plants' in the Botanic Gardens at Liverpool, published in 1808, it appears that the proprietors of that establishment possessed, at that date, about 3000 specimens of dried plants, collected by the late Dr. Forster, in his voyages to the South Seas, with large and valuable contributions from his friends and correspondents. How these plants came into their possession is uncertain, but they could hardly have been presented to them by Mr. Shepherd, the Curator, as stated by Sir Joseph Hooker in the introductory essay to his 'Flora Novæ-Zelandiæ,' or his name would almost certainly have been mentioned as the donor. At least this may be inferred, because on the very next page a very high tribute is paid to Mr. John Shepherd for his services to the Garden. Be that as it may, the collection will shortly be accessible to botanists generally, thanks to the perseverance of Sir Joseph Hooker and the sensible view of the matter taken by the present members of the Corporation when it was represented to them that these dried plants where practically useless where they were, but would be valuable at a botanical establishment like Kew. This act of the Corporation deserves to be recorded, because some thirty years ago, when Sir Joseph Hooker was engaged on his 'Flora Novæ-Zelandiæ,' he applied to the then custodians of the collections to transmit it temporarily to Kew for comparison and publication, and his request was refused.

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* Mr. Carruthers has before called attention (Journ. Bot. 1880, p. 35, footnote) to the action of the Editor of 'Nature' in matters of this kind.

"Botanical investigations in connection with the 'Challenger' Expedition again brought to mind the existence of this interesting collection at Liverpool, and it was determined to make another effort to rescue it from oblivion, which was fortunately successful. A few words respecting the botanical collection of Cook's voyages generally, and of this one in particular, will be welcome to those interested in botany. Sir Joseph Banks and Dr. Solander accompanied Capt. Cook on his first voyage round the world; John Reinhold Forster and George Forster, father and son, were the botanists of the second voyage (1772–75); and Mr. Anderson, the surgeon of the expedition, collected a little on the third voyage. From a statement in Sparmann's 'Travels in South Africa,' it seems that Forster the elder undertook the duties of naturalist to the expedition for the sum of £4000, and he took his son with him, then only seventeen years old, as an assistant. On arriving at the Cape of Good Hope they fell in with Sparmann, who, at the instance and expense of Forster, was added to the scientific staff, and continued with them until the return to the Cape in 1775. Considerable collections of plants were made in New Zealand, many parts of Polynesia, and the extreme south of America, and smaller collections in some of the Atlantic Islands, including St. Helena, Cape Verd Islands, and Canaries. On returning to England the Forsters soon commenced publishing the botanical results of the expedition, and an authenticated set of all the published plants at least was deposited in the British Museum. The Cape plants, however, which they did not publish, are apparently not represented there. The first botanical work, 'Characteres Genera Plantarum,' appeared in 1776, and the title-page bears the names of both father and son, and this was the only one published in England. For the rest, the botany was done by the son alone. His 'Florula Insularum Australium Prodromus' appeared at Göttingen in 1786, and 'De Plantis Esculentis Insularum Oceani Australis' at Berlin, in the same year, followed by 'De Plantis Magellanicis et Atlanticis,' at Göttingen, in 1787.

"These works, we believe, constitute the whole of the published botany of the expedition, and, though very meagre, are extremely interesting, being the foundation of our knowledge of New Zealand, Antarctic, and Polynesian vegetation.

"The collection now acquired for Kew is excellently preserved, and the plants mostly named and localised. It comprises altogether 1359 species, 785 of which were collected on the voyage with Cook, and the rest, from various parts of the world, are probably some of those alluded to above as having been presented to Forster by his friends.

"The collection includes a large proportion of the plants published by the Forsters, but it is not complete. Roughly, there are 187 species from Polynesia, 119 from New Zealand, 21 from the extreme south of America, 23 from the Atlantic Islands, including all those described by Forster from St. Helena, and 9 from Australia. Besides the foregoing, which are all phanerogams, there are 36 ferns, but they include only a small portion of the species described by Forster."

The following is the letter which I wrote to 'Nature,' and which was refused insertion:—

"It is gratifying to learn that the Kew Herbarium has acquired from Liverpool a collection of plants made by the Forsters during Cook's second voyage. But I think these plants are much more widely distributed than Mr. Hemsley seems to imply. Lasègue mentions Forster's plants as existing in the herbaria of Sir W. J. Hooker, Vienna and Leyden; and DeCandolle ('Phytographie,' p. 412), states that there are "un grand nombre d'echant. de l'expédition autour du monde dans l'herbier de l'Univ. de Kiel," and others in the Paris Museum.

"At the British Museum we have the herbarium of G. Forster, purchased at Lambert's sale, which David Don describes as 'the entire Herbarium of George Forster, collected during Cook's circumnavigation, and from which he published his 'Florula of South Sea plants' (Appendix to Lambert's 'Pinus,' p. 28); and sets from other localities visited during the voyage, and presented by the Forsters to Sir Joseph Banks. Some, at any rate, of these seem more extensive than those received at Kew, *e.g.*, the latter collection contains 'roughly . . . . 23 from the Atlantic Islands'; whereas the list of plants sent to Banks by the Forsters contains 78 species from Madeira alone. Our collection of ferns is also much more extensive. Mr. Hemsley says, 'The Cape plants . . . . are apparently not represented in the museum'; but we have a list of 85 species presented to Banks by the Forsters, the specimens corresponding with which are in the National Herbarium.

"We have also a large collection of drawings—301 in all—of the plants collected by G. Forster during the voyage."

Besides the plants referred to above, we have in the Museum a third set, included in the Herbarium of Pallas, which was also purchased at Lambert's sale, and of which an interesting account was published by Lambert in Trans. Linn. Soc. x. 256–265. He says, "George Forster . . . . sent to Pallas fine specimens of all the plants gathered during his voyage with Cook. I find several species here not in his own herbarium which I purchased some years ago from his father-in-law, Professor Heyne." There is also a fourth set, comprising only a few specimens mounted on small paper and endorsed "G. Forster's little Herbarium."

There would seem to be some confusion as to G. Forster's own herbarium. Although D. Don describes the collection in Heyne's possession as "the entire Herbarium of G. Forster," the preceding remark of Lambert shows that it did not contain all the plants collected by him.* Moreover, writing to Banks from Cassel, Nov. 26, 1780, he says, "We know not whether you were ever informed that, on my quitting England, my books, instruments, curiosities and herbal, were embarked on board a Hamburg trader, which was lost on the coast of Jutland. My chests were saved, it is true; but, owing to my great misfortune, when I received them here, their contents were all thoroughly rotten; so that the expense of carriage hither as well as the charge of saving them from the wreck were a dead loss. The loss of my herbal has never been replaced, as I had in it most of those specimens of which there are now no duplicates, except those which you had from us at the revision of our herbals." (MSS. Banksian Correspondence, i. 309).

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* The number of species contained in it was 453.

This "revision of herbals" took place in 1778; we have a list in Sir Joseph Banks's handwriting headed, "List of plants given me by Messrs. Forsters when I looked at their specimens in Jan. 1778 and compared them with my Herbarium." This list contains about 236 species, of which 85 are from the Cape; another list enumerates 78 from Madeira; and there is also a 'Catalogue of a collection of plants presented to Joseph Banks, Esq., by John Reinhold Forster and George Forster' (in the handwriting of the former), in which 255 species are enumerated, 19, however, being "blank or wanting in this Herbal C."

It may be of interest to transcribe a note by Robert Brown, which is among the MSS. in the Botanical Department of the British Museum. It is a copy of a memorandum by Banks, and Brown appends to it —"Copied March 9th, 1828, having obtained leave the same day to do so from Sir Edward Knatchbull, to whom I delivered it, along with the portrait of Captain Cook, Sir J. Banks's diplomas, and several other things of smaller importance." The note runs thus:—"John Reynhold Forster and George his son embarked in the year 1772 on board the 'Resolution,' Capt. Cook, bound to the South Seas on discovery, sent by the Board of Admiralty; the father as naturalist and the son as his assistant, in my room when I was disappointed of my anxious desire of undertaking that voyage, by the machinations of Sir Hugh Palliser, the Comptroller of the Navy. For their reward they had 4000 pounds, which at my desire was voted by the House of Commons to enable Dr. Jas. Lind, of Edinburgh, M.D., to accompany me; but the vote having passed in vague terms it was thought proper to apply it to the benefit of the voyage of discovery in that manner. On their return they did me the favour to present me with very many specimens, both of plants and animals which they had collected in the different countries they had visited. In the year 1776 I purchased of them, for 400 pounds, all the drawings of animals and plants which they had made in the course of the voyage." J. R. Forster's letter ('Banksian Correspondence,' i. 132), dated Jan. 9, 1776, speaks of the sum offered by Banks as four hundred *guineas*.

The drawings are in various stages of completeness, some being coloured throughout, others in part, and others merely pencil sketches, some of them very incomplete. They are localised and dated by Forster and named by Solander. Among them are the originals of the plates illustrating G. Forster's 'Fasciculus Plantarum Magellanicarum' in Comment. Soc. Gotting. ix. (1789). From them were prepared a number of copper-plates, of which Pritzel says, "Icones plantarum in itinere ad insulas novis australis collectorum ineditæ 130 tabulæ æneæ in folio, fuerunt olim in Bibl. Lambertiana." This copy is described in the Catalogue of Lambert's sale (April 19, 1842), as containing 131 plates, "in

2 vols. royal 4to, calf"; it was bought by Mr. Bohn for £1 12s. I have met with no reference to any other copy, but we have in the Botanical Department a similar volume, containing 129 plates, all written up by Solander with reference to the place where the plants were published, which was for the great majority G. Forster's 'Prodromus.' The plates are all in a very unfinished state. I can find no reference to these copper-plates, either in the 'Banksian Correspondence,' or in the works of either of the Forsters. George, in his preface to the 'Prodromus,' speaks of the figures—mere details of flowers—published in the 'Characteres,' but does not refer to any larger work, such as must have been projected.

There are numerous letters from and concerning both the Forsters in the 'Banksian Correspondence,' but these do not throw much light upon their botanical work. It may be worth while to reproduce, from Rees's 'Cyclopædia,' the account of the father:—

"Forster, John Reinhold, an eminent naturalist and philologist, was the son of a burgomaster at Dirschaw, in Polish Prussia, where he was born October 22nd, in the year 1729. In early youth he had few advantages for education; but about the age of fifteen years he was admitted into the Gymnasium of Joachimsthal at Berlin. Under the tuition of Menzelius and Heinsius he made considerable progress in the learned languages; and he also devoted a part of his attention to the study of the Coptic, and to the acquisition of several of the modern languages, and particularly the Polish. In the year 1748 he was entered at the University of Halle, where he studied Theology, and continued his application to the learned languages, among which he comprehended the Oriental. After three years he removed to Dantzic, and distinguished himself as a preacher, imitating the French rather than the Dutch manner; and in 1755 he obtained a settlement at Nassenhuben. In the following year he married his cousin, Elizabeth Nikolai. During his residence in this place, he employed his leisure hours in the study of philosophy, geography, and the mathematics, without desisting from further improvements in his acquintance with the ancient and modern languages. With a small income and increasing family, the difficulties he experienced induced him to accept the proposal of removing to Russia, in order to superintend the new colonies at Saratow. Much, however, as he was approved, during an interview with the members of Government at Petersburg, some circumstances occurred which rendered his new appointment of short duration; but on his return to the capital, advantageous offers were made to him by the Academy of Sciences, and by that of Moscow, both which he thought proper to decline. Having for some time indulged unavailing expectations from the Russian Government, he removed to London in the year 1766, with strong recommendations, but with very little money. After his arrival, he received from the Government of Russia a present of 100 guineas; and he also made an addition to his stock by the translation of 'Kalm's Travels' and 'Osbeck's Voyage.' At this time Lord Baltimore proposed to him a settlement in America, as superintendent of his extensive property in that country, but he preferred the place of teacher of the French, German and Natural History, in the dissenting academy at Warrington. This situation, however, he soon abandoned, and returning to London, he was engaged, in the year 1772, to accompany Captain Cook, as a naturalist, in his second voyage round the world. At this time he was 43 years of age, and his son George, who went with him, was 17. Upon his return to England in 1775, the University of Oxford conferred upon him the degree of Doctor of Laws. At this time he was projecting, with the assistance of his son, a botanical work in Latin, containing the characters of many new genera of plants, which they had discovered in the course of their voyage. An account of the voyage having been published by his son in English and German, the father was supposed to have had a considerable share in it; and as he had entered into an engagement not to publish anything separately from the authorized narrative, he thus incurred the displeasure of Government, and gave offence to his friends. Independently of the violation of his engagements, he was also chargeable with having introduced into his work several reflections on the Government which appointed and also on the navigators who conducted the expedition. The father and son, finding that, in consequence of those circumstances, their situation in London was become unpleasant, determined to quit England. Before the execution of their purpose, their condition became embarrassed and distressing; but happily for Mr. Forster, he was invited, in 1780, to be Professor of Natural History at Halle; he was also appointed Inspector of the Botanical Garden, and in the following year he obtained the degree of M.D. His health, however, began to decline, and the death of his son George so deeply impressed his mind as to aggravate his other complaints. Towards the commencement of the year 1798 his case became desperate; and before the close of this year, *viz.*, on the 9th of December, his life terminated, at the age of 69 years and some months. Mr. Forster's disposition was, unfortunately for his happiness and reputation, extremely irritable and litigious, and his want of prudence involved him in perpetual difficulties."

It is evident, from this account, that J. R. Forster was a man of very varied attainments and great energy; the 'Banksian Correspondence' contains abundant evidence that the judgment passed upon him in the last sentence is a correct one. His dedication to Solander of the 'Flora Americæ Septentrionalis' is couched in terms so flattering as to be fulsome. Forster considered he had been unfairly treated by Cook; and from his own statement of the case, as detailed in a long letter to Banks (not dated, but apparently written in 1778), it would seem that he had some ground for his belief. It would certainly appear, from the following passage in a letter from Solander to Banks, dated Sept. 5, 1755,—which I cite because it gives a contemporary opinion of Forster's character,—that it was at any rate contemplated that Forster should be part author of the account of the voyage.

"Mr. Forster overwhelms me with civilities upon your account. He is of all men I know either the most open or the greatest fool.

He certainly has made some clever remarks during the voyage; but he talks rather too much of them. You cannot imagine how much the man is mended since he came home; the officers say they hardly know the man. He came home thinking himself very great; now he, like Bruce, is reduced, even in his own opinion. Some days ago he desired me to call upon him, and he then desired me to pick out of his insects two of each species, one for you and one for the Museum, which I did not think proper to refuse. He has very few indeed from the South Seas, but some very fine ones from the Cape. I believe I told you before, that in the rest you are to be the third sharer: 1st, Br. Mus.; 2nd, Roy. Socy.; 3rd, Banks; 4th, Tunstal; 5th, Lever, &c.

"Ld. Sandwich has desired him to, by way of specimen, send in some sheets, containing an account of what happened at Dusky Bay, New Zealand. If approved of, he is to write the account of the Voyage, and he is to have ½ the profits, and ½ to Captn. Cook."

The manuscript, when sent in, was rejected by Lord Sandwich, "without alledging any other ostensible reason than the general expression, it would not do;" and Forster further adds, that the same nobleman "had already represented [him] to His Majesty as an obstinate, violent, and impracticable man, instead of recommending me to the King according to his promise." He certainly seems to have met with an unfavourable reception at court, and he attributes this to the action of Sandwich. He considers he fell under Sandwich's displeasure on account of a circumstance which he thus narrates:—"I bought at the Cape of Good Hope various live animals in order to present them to Her Majesty, to the amount of 200f. When I arrived in England, Lord Sandwich came on board the 'Resolution,' accompanied by Miss Ray. She saw the animals, and repeatedly told my servant she wished to have them; but my man told her they were destined for Her Majesty, but I am sure had I preferred Lord Sandwich's mistress to the King's royal consort I would have done better; whereas, now I have brought upon me the noble lord's odium." The whole letter is of interest, but too long for transcription; it occupies pp. 171–181 of vol. i. of the 'Banksian Correspondence.' A letter, dated Sept. 26, 1778, shows that Forster did not despair of obtaining some payment from the Government: in it he writes:—

"I have proposed Lord North a plan for sending 20 millions sterl., without taxing the public. I begged only secrecy in case my plan were rejected, and I stipulated a sum and an annuity if it were adopted. His secretary, Mr. Robinson, tells me in his letter that it is not usual to make stipulations, and promises that my plan shall be examined with candour and due attention, if I will give it to Ld. North without promising me the least reward. But I have some notion that Lord North will not be long at the head of the Treasury; and I shall reserve my plan for his successor, to whom I can likewise offer £10,000 from a foreign Prince. You'll think me crazy talking in such a strain, but it is all fact." It would be interesting to know how Banks replied to this proposal.

George Forster seems to have resembled his father in many respects. Of his earlier work his father gives the following account in dedicating to him his 'Enchiridion' (1788):—

"Tandem decimo ætatis tuæ anno exacto, mecum iter in Rossiam suscepisti. In hoc itinere quotidie, prout sorte res novæ se offerebant, inter confabulationes sedulo tibi naturam explicui; nec me laboris pœnituit, expertus enim id sum, quod puer decennis, sine ullo auxilio, solus plantas ad Linnæanas descriptiones jam probe nosses; adeo ut præ gaudio vix mihi a lacrymis temporare potuerim. Dein in Anglia, quam anni 1766 autumno perii, linguæ Anglicæ familiarem usum et elegantiam et præterea naturæ cognitionem magis certam et variam, cum mathematum et physices rudimentis didicisti, simul et me juvasti in tradendis elementis linguæ gallicæ, et in Anglicum sermonem transfundendis operibus discipulorum Linnæi, videlicet Kalmii, Osbeckii, Toreenii et Loeflingii; denique et itinera Bougainvillii, Bossuii, Grangerii et Riedeselii junctis viribus Anglica lingua publicavimus.

"His et aliis laboribus præparatus, mecum iter cum amico nostro Cookio, ad mare notium cum utilitate suscipere poteras. In hoc itinere, varia, novaque naturæ miracula non solum vidimus, verum et verbis et graphio delineavimus. In plantis imprimis adumbrandis adjutore usi fuimus amico optimo Sparrmanno, cujus labores in ordinem redigere, simul et plantas delineare tui fuit officii; mea denique provincia erat hos labores hinc inde curatius inspicere, et paucissimis in locis corrigere. . . . . Circiter quingentæ enim novæ plantæ, et trecenta animalia sunt magna cura adumbrata. Quilibet cordatis mirabitur, tot labores ad uno homine et juvene qui nondum vigesimum adtigerat annum et unico socio laboris potuisse perfici."

Of his life after their return to England, Rees gives the following sketch:—

"On leaving England, he wished to settle at Paris. After a temporary residence in that city, he removed, in the year 1779, to Cassel, and undertook the office of Professor of Natural History in the University of that place. He afterwards accepted the offer of a chair in the University of Wilna, but found no permanent satisfaction in a country where liberty was expiring under the intrigues of Russia and Prussia. Desirous of a retreat, he entered into a treaty with Catherine II., who projected a voyage of discovery round the world; but the proposed expedition was prevented by a war with the Ottoman Porte; and thus the hopes of Forster were frustrated. His active mind, however, led him to wish for useful employment, and the reputation which he had acquired induced the Elector of Mentz to appoint him President of the University of that city. He hailed the dawnings of the French Revolution, says M. Pongens, little apprehending, we may say, the clouds that subsequently overshadowed them; and he was deputed by the people of Mentz, who had formed themselves into a convention, to repair to Paris, and to request that they might be invited to the French Republic. But while he was thus employed, the city of Mentz was besieged and taken by the Prussian troops. By this disaster he lost his whole property, and his numerous MSS., which fell into the hands of the Prince of Prussia. The domestic uneasiness of a conjugal kind, which he afterwards experienced, led him to form a resolution of visiting Hindoostan and Thibet, for which he acquired the necessary preparation, by studying the Oriental languages, but the chagrin occasioned by his misfortunes aggravating a scorbutic affection, which he had contracted during his voyage round the world, prevented the accomplishment of his purpose by terminating his existence, which event took place at Paris, February 15th, 1792."

Papers like the present, if of no great importance in themselves, may have the effect of inducing botanists to realise that there exists in the Department of Botany of the British Museum a vast store of material which is comparatively unknown and unconsulted, but which is readily accessible and of historical importance. From time to time evidence of this has been brought forward in this Journal. Mr. Hemsley's paper "On Bermuda plants in the Sloane Collection" (Journ. Bot. 1883, 257), and my own on Masson's collection of plants and drawings (Journ. Bot. 1884, 114, 144), may be cited as examples; while Mr. Jenman has recently examined the Ferns of Sloane's Jamaica Herbarium, with interesting results which will be published in the January number.

A NEW CHINESE *SALVIA*.

By F. F. Hance.

Salvia (Leonia, Notiosphace) **scapiformis.** — Caule basi ramoso ramis florigeris erectis subnudis glaberrimis, foliis subradicalibus cordato-ovatis obtusis crenatis glaberrimis olivaceo-viridibus subtus purpurascentibus ad 22 lin. longis 16 lin. latis petiolo bipollicari caulinis nullis v. rarius 2 oppositis oblongis floralibus linearibus, racemis simplicibus v. ramosis axi glaberrimo, verticillastris laxis distinctis 5-floris, calycibus tubuloso-campanulatis 5-nerviis patentibus tomentellis vix 2 lin. longis labio superiore apice rotundato integerrimo inferioris dentibus brevibus acuminatis, corollæ lilacinæ calycem fere duplo excedentis tubo vix exserto labio superiore erecto emarginato inferiore apice bilobo lobis truncatis divergentibus, genitalibus exsertis, connectivis antice abbreviatis deflexis curvulis.

Juxta Tam sui, ins. Formosæ, m. Junio 1884 legit C. Ford (Herb. propr. n. 22314).

The flowers of this neat little plant are quite small, but they are produced most profusely, and are of so bright and delicate a colour, forming such a marked contrast with the olive-green foliage, that it is worth growing for ornament.

The species is a well-marked one, nearest in affinity to the Nipalese *S. saxicola* Wall.

SHORT NOTES.

The Characeæ of 'English Botany,' ed. iii. — In the review of the above-named work (p. 350) the Messrs. Groves seem to me to have been rather severe in their criticism. They say:—"Under *N. nidifica* Mr. Brown did not happen to see the difference between plants which Braun had distinguished, so he had no doubt Braun was wrong, and wrote, 'The nucules examined by Braun must have been quite immature ones.' As if Prof. Braun did not know unripe nucules when he saw them!" Now Braun himself ('Fragmenta einer Monographie der Characeen,' p. 94) writes, "*Tolypella nidifica forma intermedia,*—. . . . Semina . . . . unreif." And a few lines later he again says—"Antheridien habe ich nicht gesehen. Sporangia unreif." For the Messrs. Groves to have overlooked Braun's statement that the nucules were *unripe* is altogether inexcusable, as Mr. Brown devotes six lines of text to a translation of what Braun says. And if Mr. Brown did consider it "questionable whether *N. nidifica* and *N. glomerata* are more than varieties of each other," yet he kept them distinct, and left the matter *sub judice* till the plant should "again be found in the British Isles." And Braun himself admitted that he was doubtful to which of the two his "*forma intermedia*" was most allied. Respecting the absence of nucules from Borrer's Lancing specimen of *N. glomerata* var. *Smithii*, Mr. Brown is certainly wrong. I have examined a small branch of this specimen, and find very young nucules present; but it requires a magnification of 150 diameters to make out clearly that they are nucules. The specimen is in a very young state; the best developed nucule I found being in the condition represented in Sachs' 'Textbook,' ed. i., fig. 208 (ed. 2, fig, 201). I could not find them at all on some branchlets. The blunder may be "inexcusable," but Mr. Brown is not the first to make it. The specimen is figured in Sowerby's 'English Botany,' t. 1703. Sowerby found no nucules, so added a fragment from another plant (from Cley) to show a nucule. Sir James E. Smith (in the description) says, "no germens [nucules] could be found." Borrer (Engl. Bot. Suppl. sub t. 2762, correcting an error as to the locality of the Lancing specimen) states, "no nucules were produced." It is clear that these authors are wrong, and it is also satisfactory to be able to clear up a batch of blunders. But I think it would have been better to have left the reference to "intense egotism" out of the question. —R. A. Rolfe.

With Mr. Rolfe's permission, the Editor has shown us the above note. Had we overlooked Braun's statement that the nucules in question were unripe, it would certainly have been inexcusable; but we had not, and Mr. Rolfe has altogether misapprehended the object of our remarks as to Mr. Brown in connection with *N. nidifica*. To make the matter quite clear, we now quote Mr. Brown at greater length, with reference to the Lough Neagh plant:—"A very careful examination of this specimen with *N. nidifica* and *N. glomerata*, however, has not corroborated what Braun has stated.

A comparison under the microscope, side by side with typical specimens of *N. nidifica* from the Baltic, named by Profs. Braun and Nordstedt, has failed to disclose the least difference between them. The nucules examined by Braun must have been quite immature ones, which are the most numerous on the specimen, but there are a few which appear to have attained their full growth; and these are neither smaller nor more contorted than those of *N. nidifica*, and appear to be only 7–8-striate, as in *N. nidifica*, not 10-striate, as stated." Now, the only meaning we can attach to this is that the writer imagined that Braun did not know immature nucules when he saw them, otherwise it could not have been assumed that he must have examined "quite immature ones,', when there were, on the same specimen, some which appeared to have attained their full growth. It will be clearly seen that we were referring to Mr. Brown's manner of writing, and not (as Mr. Rolfe assumes) to the facts dealt with, or we should have pointed out the impossibility of "quite immature" nucules showing more striæ than full-grown ones. By the reference to the difference between *N. glomerata* and *N. nidifica* it is evident that Mr. Rolfe does not understand the question at issue—Braun distinguished the Lough Neagh plant (forma intermedia) from typical *N. nidifica*, and Mr. Brown (not having Prof. Braun's experience in examining Charas) could not see the difference; and so, as in other cases, he unhesitatingly discarded Braun's conclusions in a manner that we considered both offhand and egotistic. With regard to the *N. Smithii*, we certainly should not have considered Mr. Brown's overlooking the nucules inexcusable had he not stated that he had "very carefully examined" the specimen, and could not find even "a trace of a nucule."—Henry & James Groves.

Notes on British Rubi.—Mr. J. G. Baker, on looking over the unnamed brambles in the British Museum Herbarium, has called my attention to the following rare forms collected by me a few years ago:—*Rubus hemistemon* Mull. Foot of a stone wall, Maes-y-brynor, Dolgelley, Merionethshire. This species is only previously recorded from the counties of North Devon, Warwick, Cardigan, and Aberdeen.—*R.* (near *incurvatus*). Roadside near St. Dogmells, Pembroke, August, 1882. This plant is identical with that alluded to in Mr. Baker's Flora of the Lake District, under *R. rhamnifolius* (p. 81), as occurring at Watermillock and near Ulleswater and Haweswater. — *R. saltuum* Focke (*R. Guntheri* of British botanists). On the banks of the Wye, at the foot of the Scaur, Moccas, Herefordshire. In Samuel Dale's collection there is a specimen of *R. thyrsoideus* Bell., labelled "*Rubus Morus* Merret, Pin. 106, said by Dr. Merret to grow at Sutton, in Essex, where they call it Mulberry Bramble." This makes it clear what form was intended by Merret under this name.—H. N. Ridley.

NEW PHANEROGAMS PUBLISHED IN BRITAIN IN 1884.

The following were accidentally omitted from our List at pp. 51–57 : —

Bartholina Ethelæ Bolus.—Cape. Journ. Linn. Soc. xx. 472.
Brachycorythis Tysoni Bolus.—Cape. Journ. Linn. Soc. xx. 485.
Cymbidium ustulatum Bolus.—Cape. Journ. Linn. Soc. xx. 469.
Disa lugens, D. ocellata, D. purpurascens, D. uncinata, and D. venusta, all of Bolus. Cape. Journ. Linn. Soc. 477–483.
Disperis namaquensis Bolus.—Cape. Journ. Linn. Soc. xx. 486.
Satyrium Hallackii, S. Lindleyanum, S. marginatum, and S. saxicolum, all of Bolus.—Cape. Journ. Linn. Soc. xx. 474–6.
Solanum Andreanum Baker. — N. Granada. Journ. Linn. Soc. xx. 498.

NOTICES OF BOOKS.

The Botanical Exchange Club of the British Isles. Report for 1883 [by G. Nicholson]. Report for 1884 [by Arthur Bennett]. Manchester: printed by James Collins & Co., King Street. 1885.

We are glad to welcome two more Reports of the Botanical Exchange Club, albeit their appearance is somewhat late. And we are glad to note, too—of course assuming that the existence of our rarer plants is in no way endangered thereby—that there seems no lack of energy among the members of the Club ; the total number of plants received for distribution being, in 1883, 3735, from 33 contributors, and in 1884, 4371, from 27 contributors. Dr. Boswell's state of health has precluded him from supplying any notes ; but Messrs. Nicholson and Bennett have worked hard to supply the absence of these, the latter having received much help from Dr. Focke, of Bremen, in naming the *Rubi*, as well as from other foreign botanists. Among the most generous of the contributors we notice the Revs. E. F. & W. R. Linton, comparatively recent members of the Club ; and it is pleasant to note the return of the Rev. H. E. Fox to his old love, as further indicated in the pages of our present volume. The entire absence of Irish plants from the Reports is remarkable, inasmuch as Ireland possesses in Mr. H. C. Hart and Mr. R. M. Barrington—not to mention Mr. A. G. More, whose official duties perhaps interfere with his researches into the Irish Flora—energetic and painstaking field-botanists.

Although containing not very much which will be new to the readers of this Journal, the Reports afford a series of texts on which we are tempted to offer a few remarks. It must, of course, be borne in mind that each Report is primarily intended to be read in connection with the sets of specimens distributed by the Club, and this explains the presence in it of certain remarks which are somewhat wanting in general interest—such, for example, as the mistaking of "simply a proliferous state of *Trifolium repens*" for a monstrosity of *Lotus major*. It explains, too, what looks like a wild confusion of names and opinions when the *Rubi* come to be dealt with. "Tot homines quot sententiæ" rises in our mind as we glance down the pages devoted to brambles; but a closer examination shows an agreement in many cases between authorities such as Dr. Focke and Prof. Babington; and as these eminent men do not hesitate to differ when occasion demands, their concurrent determinations are especially satisfactory. Mr. Bennett has done well to secure Dr. Focke's help, which gives the Report a special value.

While so much confusion exists as to the plants themselves, it is hardly to be expected that the nomenclature will be satisfactorily established. We note that *Rubus pyramidalis* Bab. is placed by Dr. Focke as a synonym of *R. longithyrsiger* Lees, there being an earlier *pyramidalis* of Kaltenbach. By the reference to "Babington, Journal of Botany, 1878, p. 177," our own issue of that date is intended, in which Prof. Babington points out the necessity of this substitution. But we sought in vain for the name in Mr. Edwin Lees' published writings upon *Rubi*, and at length found it in Babington's 'British Rubi,' where "*R. longithyrsiger* Lees! MS. (1849)" is cited under *R. pyramidalis*. The name, existing only in MS. until printed as a synonym by Babington, is very properly ignored by Nyman; but it would seem that it must now take its position as the name of the plant, owing to its publication in 'Brit. Rubi.' The citation "*R. longithyrsiger* Lees" certainly is very inconvenient, inasmuch as his published papers contain no reference to it; but if the publisher of the name be taken as the authority and we read "*R. longithyrsiger* Bab.," we at once find it in the index to 'British Rubi.' Our readers may remember that this point was discussed at some length in this Journal for 1882 (pp. 53, 104, 173, 238).*

The Roses are nearly as bad as the *Rubi*; fortunately botanists are not a belligerent race, or the differences revealed in the following notes from the 1884 Report (which are interesting enough to reproduce) on two Roses might lead to serious consequences:—

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* It seems doubtful whether *R. suberectus* Anderson (Linn. Trans. xi. 218 (1815) should not give place to *R. nessensis* Hall (Trans. Roy. Soc. Edin. iii. pt. i. 20 (1794). Anderson says his plant is "the same that was brought by Mr. Hall from the banks of Loch Ness, and so accurately described by him," and adds "the impropriety of Mr. Hall's specific name will, I hope, be a sufficient excuse for my changing it." Prof. Babington says "it may reasonably be doubted if *R. suberectus* is the *nessensis* of Hall" (Brit. Rubi, p. 51); but he does not seem to have seen Hall's specimens, and we do not know if these exist. Anderson, however, seems to have had no doubt about the identity of the two, and Smith (E. B. 2572) accepts his view. It may be noted that the "specimen in the Banksian Herbarium, sent from four miles north-west from Manchester," was forwarded to Banks by his *protégé* George Caley, in whose handwriting is a ticket further defining the locality as "a valley in Pembury." The specimen from E. Forster's herbarium said by Prof. Babington to be "named by Anderson" (Brit. Rubi, 53) was named by Forster and confirmed by Smith (who notes on Caley's specimen, "Seems *Rubus corylifolius* (Fl. Brit.)": it was sent by Anderson, but not named by him, so that it is not strictly a type.

"*Rosa micrantha*, *Briggsii*. 15th July, 1883.—J. W. White. '*R. micrantha*, Sm., var. *pedunculo-nudo*, of which *Briggsii*, Baker, is only a luxuriant form. I find this variety of *micrantha* growing spontaneously in some of the hedges very near the house where I write this.'—T. R. Archer Briggs. 'Two years ago I sent to the Club fruiting specimens of this rose, which had been determined by Mr. Briggs himself. Other botanists, however, considered it to be a form of *R. sepium*, and wished for examples in flower by which to settle the question. These are now supplied.'—J. W. White. '*R. sepium*, var.'—J. G. Baker.

"*Rosa sepium*. Buckden, Hunts, 5th Sept., 1884. — W. R. Linton. 'This rose, with its very short peduncles, differs from the next [preceding] (*micrantha*, v. *pedunculo-nudo*). It cannot be the typical *R sepium* of Thuillier's Fl. des Env. de Paris, which work I know, and the description of *R. sepium* has "fructibus oblongo-ovatis."'—T. R. Archer Briggs. Passed by Mr. J. G. Baker. This, as Mr. Briggs rightly remarks, has not the fruit of the original *sepium*, but it seems best placed under it; it is less different than a curious form that occurs in Surrey, which M. Crépin seems inclined to refer to a rare continental species, but which has all the essential general characters and growth of *sepium*. Herr von Uechtritz, to whom I sent Surrey examples of this form, considered it represented Thuillier's '*sepium*, *inodora*, Fr.,' but I cannot agree with him in either reference, but at present I know not what name to give these Surrey specimens."

Another puzzling group of plants, the *Hieracia*, is being taken up energetically by the Messrs. Linton, who send "a fine series" each year, and to whom we would venture to suggest that a set should be placed in the British collection of the National Herbarium at South Kensington, so as to be available for public reference.

One lesson to be learnt from the Reports is that greater care is requisite in applying the names of continental forms. Many names have crept into our books on grounds which we fear would hardly be tenable if the plants to which they have been assigned could be compared with the types: and several of these are corrected in the Reports. Perhaps Mr. Bennett carries caution a little too far when, *àpropos* of a plant named by Mr. Beeby *Carex xanthocarpa*, he says, "I think he is probably correct, but I have not seen a type-specimen of Degland's plant, and in *Carices* I should decline to name any specimen decisively until I had." But the error, if error there be, is on the right side.

We notice that Mr. Bennett adopts an unusual spelling—*Goodenoughii*—for the specific name of the *Carex* which British authors write *Goodenorii*; the strictly accurate spelling, however, is *Goodenowii*, that being the form of the word employed by Gay in establishing the species (Ann. Sci. Nat. 2nd s. xi. 191 (1839)). Mr. Bennett points out that Goodenough's name *teretiuscula* (1794) is ante-dated by Roth, who (in 1788) called the plant *C. diandra*: according to Nyman, however, who sets it aside as "nomen erroneum," the name is to be attributed to Schrank (1781).

A large number of typographical errors mar the appearance and sometimes—if, as we suppose, "Ponning, Berks" (1883, p. 98) is intended for "Sonning"—the sense. Surely "ordinary seaside *Geranium Robertianum*" is not the same as *G. purpureum* Forst. (p. 85)? And in other ways the Reports bear evidence of hasty revision: *e.g.*, the note on *Scirpus uniglumis* (1884, 116) is not intelligible.

We have never been able to fathom the exact meaning of the "non-natural" sense in which the word "new" is employed either by the Exchange or Record Club. In the 1883 Report, the Hawkhurst locality for *Dentaria* is called a "new station," with a reference to this Journal for 1882. If published in 1882, we do not see how the station can be styled "new" in 1885, especially as the record in Journ. Bot. (p. 185) mentions an earlier gathering in 1872. More puzzling still is the placing of *Polygala vulgaris* from Bucks as a "new County Record" in the 1884 Report: this plant is duly given for Bucks in 'Top. Bot.,' and if we suppose a misprint and that *P. calcarea* was intended, that species is recorded for the county in Journ. Bot. 1878, p. 54. The "New County Records" in the 1883 Report consist almost entirely of Mr. Beeby's S. Lincoln and Surrey plants and the Hunts plants of the Rev. W. R. Linton—all of which have been duly recorded in our pages.

The following are the more interesting portions of the Reports —the Rubi, Roses, and Hieracia excepted:—

From Report for 1883.

"*Gentiana germanica* Willd. Chalky banks, Crowell Hill, Oxon, Sept., 1883. Crowell Hill is one of the Chiltern range, and within two miles of the Bucks border. The plant occurred abundantly on very bare chalky slopes, but, although extremely variable in size and number of flowers, yet the size of flowers seemed fairly constant. I did not notice any great difference in size of corolla lobes, nor did the length of germen seem worth consideration. The leaves are broader than those of *Amarella*, and the colour considerably lighter, more blue than purple, and often lilac. *G. Amarella* grew with it plentifully, but it required persistent search to find one in flower, whereas *G. germanica* was in profuse blossom, scarcely over its prime. There must be ten days difference in the time of flowering of the two plants. A few plants were found with only four lobes to the corolla. While in the greatest abundance on slopes of almost bare chalk, still others were scattered in the grass, and some few were found on the tertiary above the chalk. This hill yields, in its only Oxford locality, *Cephalanthera ensifolia*. *Gentiana germanica* had not previously been recorded for Oxford.—G. C. Druce" (p. 92).

"*Scutellaria galericulata* × *minor*. Virginia Water, Surrey, July and August, 1883.—Geo. Nicholson. I think there can be little doubt of this being a hybrid. It grows in considerable quantity at the station named, occurring in both Berkshire and Surrey. Dr. Focke, who has made a special study of plant hybrids, says 'Intermediate between *S. galericulata* and *S. minor;* probably a hybrid.' The only hybrid *Scutellaria* mentioned in Dr. Focke's great work, 'Die Pflanzenmischlinge,' is *S. pubescens* Martrin-Donos; the description of which given by its author in the 'Florule du Tarn' will not fit in with my plant. I recently had the opportunity of examining, in the Paris Herbarium, a type-specimen of *S. minori-galericulata* Michalet (Notice sur quelques plantes récemment observées dans le département du Jura et le pays de Gex) the description of which seems to have escaped Dr. Focke. This plant comes nearer *S. galericulata* than any of those distributed to the Club" (p. 93).

"*Myosotis alpestris* Schmidt. Ben Lawers, Perth, 3700 ft., July 31, 1882.—Revs. W. R. Linton and E. F. Linton, the latter sending the following note respecting the new record for Forfar :—From the foot of wet rocks in one of the western glens of the Clova Mountains, Forfar, Aug. 3, 1883. The Rev. H. E. Fox and myself found very little, and had to be chary in what we took, though we were not aware at the time that it was unrecorded for Forfar. Probably there was more on the wall of rocks above us, still we could not see it" (p. 93). [Some reference should have been made to Dr. Buchanan White's note on p. 26 of the 'Journal' for this year, from which it appears that the plant is an introduction to this locality.—Ed. Journ. Bot.]

"*Juncus lamprocarpus* × *acutiflorus*. Bog, Hedge Court, Mill-pond, Surrey, Sept. 9, 1883. See Report for 1882. Since sending to the Club I have sent further specimens to Dr. Buchenau, calling his attention to the uniform sterility of the plant; he replies (22nd August, 1884), 'From the form of the perianth, and from your observations, probably = *J acutiflora* × *lamprocarpus*. Interesting, as hybrids are rare in this order.'—W. H. Beeby" (p. 96).

"*Carex vesicaria* L. var.? or hybrid with *ampullacea?* By Wire Mill Pond, Surrey, June 10, 1883. Almost or quite sterile. The very few (apparently perfect) nuts that I have been able to find resemble those of *C. vesicaria*, but are smaller. The leaves are those of robust *vesicaria*, but the perigynium shows considerable approach to *ampullacea*. I cannot detect the latter plant (*C. vesicaria* is abundant) in the immediate vicinity, but it occurs within a few miles. The plant was of a very dark, somewhat translucent, green.—W. H. Beeby" (p. 98).

From Report for 1884.

"*Thlaspi perfoliatum* L. Stony ground near Charlbury, Oxon, April, 1884. Sent in order to show that it still exists in Oxfordshire, for which county it is queried in Top. Bot. It occurred in many thousands in the above locality, which is about eight miles from the Binford locality mentioned in Sibthorp and other authors. —G. C. Druce. This is a very interesting re-discovery of a very local plant" (p. 102).

"*Potamogeton fluitans* Roth. Mr. Fryer sends a single specimen from some pits in the neighbourhood of Ramsey, Hunts (Co. 31), accompanied by a living specimen; this up to date (June, 1885), shows no signs of flowering with me, but seems quite identical with specimens growing with it from the Loire, France

(M. J. Lloyd, of Nantes). This is a plant that has often been reported as British, and as often contradicted, forms of *polygonifolius*, *rufescens*, and *Zizii* have been mistaken for it. There seems no reason to doubt Mr. Fryer's specimens being the true plant; they agree well with specimens in the Berlin Herbarium determined by Nolte and Chamisso, and with others in my own collection from the herbarium of the late A. Braun. I am in hopes that Mr. Fryer's specimens will fruit with him this year, when its identity will be made quite certain. Indeed, the observations of my acute friend almost make me feel sure; *i. e.*, 'its habit of growth is quite different from *P. natans*, which grows in the same pit; of that roots come up freely, of this the roots strikes deep in the mud. All the submerged leaves are alike, down to the very bottom, linear-lanceolate. I can see its distinctiveness from deep-water forms of *polygonifolius* better now I have had a second look at it growing.' There is one thing Mr. Fryer's specimens show, *i. e.*, that the non-branching of *natans*, *fluitans*, and *polygonifolius* has exceptions, and in this I am supported by the opinion of my friend Rev. T. Morony [Morong] of Mass., U.S.A., who writes that 'while the rule here, there are exceptions.' . . . . . From the usual state of *natans* it differs in the upper leaves being gradually tapered into the petiole, the midrib of much thicker consistence, the stipules blunter, *the submerged leaves having laciniæ*, the fruits smaller and more rounded. The submerged leaves, especially the young ones, are of very thin texture. From all stages of *polygonifolius* it differs at once by the *thick peduncles*, larger flowers, and larger fruit. The forms it is liable to be mistaken for are:—Of *natans*, the var. *prolixus* of Fr. (*P. serotinus* Schrad.); and of *polygonifolius*, the var. *pseudo-fluitans* of Syme. The question of the phyllodia of *P. natans* I have not yet been enabled to trace by growing specimens, but in specimens of a form of *polygonifolius*, watched for five years (from N. Wales, J. E. Griffith), I find the laminæ to drop off, leaving the petioles, which become nearly white, but in this state are persistent to October and November. The leaves of this form assume a very *natans*-like look, much like the specimens from 'Fleet Pond, N. Hants,' in Mr. H. C. Watson's herbarium at Kew. It is this form of *polygonifolius* that is often named *natans!* When in fruit, however, there is no difficulty. The distribution of *P. fluitans* Roth. is not yet worked out, the barren specimens in various herbaria being extremely difficult to separate from some others" (pp. 111, 112).

"*Potamogeton Griffithii* A. Bennett. Lake, Llyn-an-afon, Carnarvonshire.—J. E. Griffith. Several specimens of this plant. I have had this growing with *prælongus* and *rufescens* for three years; its growth is much slower than either, and it does not die down during the winter, the upper part only rotting away. By this means I have assured myself that it is not *prælongus;* at no stage of its growth, from the first leaves to the flowering stage, can it be mistaken for *prælongus*, on careful examination of its structure (leaves, stem, &c.). I hope to succeed in getting my specimens to fruit this year" (p. 114).

"*Juncus nigritellus* Don. Wet sand, near Wells, Norfolk, Sept.

8, 1884.—E. F. and W. R. Linton. The plants from Wells do not quite agree with a specimen so named, gathered by Mr. C. Bailey on the coast of Merioneth, but are about identical with a specimen from Mr. Boswell Syme from Scotland. It is interesting to have a new locality for a variety of which the 'Student's Flora' states nothing satisfactory is known. '*J. lamprocarpus* fructibus nigro-fuscis.'—Dr. Buchenau. '*J. lamprocarpus* v. *nigritellus* Don.—Dr. J. Lange" (p. 115.

"*Festuca* '*glauca*.' Uig, Skye, Aug. 6, 1884.—F. F. Linton. 'Is a form of *F. rubra* L., which is not specially described in my Monograph Fest. europ. It comes nearest to *F. rubra*, sub-v. *juncea* (Mon. p. 139), but differs by its very glaucous leaves, this colour being due to a thin stratum of vegetable wax. I call it *F. rubra*, sub-v. *pruirosa* [*pruinosa?*] (nov. forma).'—Hackel in litt. 'These seem to be creeping plants allied to *rubra*.'—C. C. Babington.

Charles Darwin. By Grant Allen. 'English Worthies' Series. Longmans.

Mr. Grant Allen's book is a veritable triumphant march. Every page is bright with epithets,—"central Darwinian luminary," "magnificent all-sided conception," "stately fabric of vast theories,"—as so many gaudy banners on which is inscribed the defeat and rout of the teleological school: of all, that is, who profess to see in nature the working of any intelligence higher than human. We are reminded of the complacent utterance of the panegyrist of Epicurus—

> Quare religio pedibus subjecta vicissim
> Obteritur, nos exæquat victoria coelo.

But a triumphant march is not a victory, although it may lead light-headed people to suppose that a victory has been gained. It is simply a "demonstration," in the modern political sense of a show and pageant, that proves nothing, but is got up to seem to mean much.

But rhetoric aside, an arm of offence which teleologists can brandish as well as Darwinists, we ask what view of the universe it is that Mr. Grant Allen wishes us to accept on the strength of Darwin's discoveries. The sum is this, that matter is prior to mind, mind being the growth and outcome of matter: that there is no intelligence above man's, none at least that has anything to do with the world in which man moves: that a house is a thing planned and contrived, not so the architect—he is "the last product of kinetic solar energy," energy that needed neither creation to start it, nor providence to direct its course. And the proof? It is the old story. First a hot, spinning nebula, or something of that kind. A certain degree of heat, no doubt: call that x. And a certain density, uniform or varying: call the average density y. And a certain angular velocity of rotation: call it z. These are definite quantities. Now we ask, why x, y, z, rather than any other quantities, x', y', z'? That is due, we are told, to the previous unknown history of the nebula. That answer is mere shuffling.

The question always returns: why have the antecedent conditions been such as to give this present collocation, and not any other of the myriad possible collocations or arrangements of material? A teleologist will say that the collocation which x, y, z represent, was planned by Intelligence. *Stet pro ratione voluntas.* Can Mr. Grant Allen put his hand on any one of Charles Darwin's discoveries that shall disprove this teleological explanation? Unless he can, the position that matter is prior to mind remains unproven.

But the nebula spins on, cools down, condenses into liquid, solidifies, till the tiniest and lowliest of vegetable organisms blooms suddenly on the bosom of primeval mud. How is this? we ask. Some happy variation. A pretty thread to hang a whole philosophy on, like an elephant from a horse-hair. But there the organism is, and of course it reproduces others, and they adapt themselves to their environment, and some individuals are a little unlike their progenitors, and this unlikeness proves an advantage to them, and they transmit it to their posterity; and those individuals who have this advantage, being stronger, supplant such as have it not. So vegetation grows luxuriant and manifold. And the lowest plants are very like the lowest animals, often quite undistinguishable; so that we may suppose both plants and animals to have come from one humble source, that primitive organism, child of happy variation. There is a good deal here debatable enough; and much that undoubtedly is true. The principle of natural selection must ever hold its place by the side of the law of universal gravitation as one of the grand laws of Nature. This means that Darwin must stand with Newton, the naturalist with the astronomer. In his capacity of naturalist he is worthy of no less a place. Whether natural selection will account for the variation of species to the extent which he cautiously implies, and his disciples open-mouthed proclaim, is matter of much question. A happy variation, as a shade of colour, or a slight increase of neck, must be small to begin with, too small very often to be of any assistance to its possessor in the struggle for life. Two beings must unite, each with this happy variation, in order to transmit it at all certainly and pronouncedly. Then there is the tendency to atavism, or reversion to an earlier and less improved type. Likewise, catastrophes and wholesale devourings, which involve improved and unimproved in a common ruin. So natural selection works through a long chapter of accidents, and gets on slowly. But has it not infinite time to work in? No, it has not. Modern research tends to show that at a certain epoch, a long way back certainly, but still a limited term of years, no life, or none but the very lowest, was possible upon this earth by reason of the temperature.

These are difficulties for naturalists. The teleological school take their stand at three other principal points. The first is the origin of all things: why this world with its collocations rather than any other possible collocations, unless by the selection of Intelligence. The second is the origin of life. These two points Darwin has left as he found them. The third is the origin of man, and on this he has written in his 'Descent of Man,' how "from the latter (the Old World monkeys), at a remote period, man, the wonder and glory of the universe, proceeded." Now, what does the teleologist say to that? I abstract here from all teaching of Holy Scripture, and argue by science and philosophy, as we should have had to speculate had the Scriptures never been given to us. The teleologist then says that, speaking of animals, it is a mistake to discuss their bodily structure alone. In all the higher animals certainly, there is some sort of a soul. The soul is more perfect, if not in its being at least in its operation, where the body is more perfect.

There is a difference between a material soul and a spiritual soul in this, that the latter can and the former cannot apprehend an universal idea away from individualizing circumstances. None but bodies of the highest organization are capable of uniting with a spiritual soul; this, because soul and body in the animal have one joint operation. An inferior organism cannot take a concurrent part in high psychical operations. Suppose then that all that Darwin has written on the gradual evolution of the anthropoid ape were true. Evolution is a progress of ever better organised bodies. In time, when organization is sufficiently advanced, suppose the next generation to have infused into it a spiritual and immortal soul. I have nothing to say to the antecedent possibility of man having been evolved in this way; but let us suppose it possible, which is going to extreme Darwinian lengths. Even then, there is no account rendered of the soul of man, unless that be ascribed to the creative act of a divine Intelligence. There is no evolving an immortal spirit out of cosmic mist, not even through billions of transformations, because thought and matter are not in the same order. If Mr. Grant Allen maintains that they are, we ask on what particular process of inductive reasoning gone through by Darwin he relies for his proof. It is not enough to show that human thought is conditioned on a certain bodily organization disposed and operating in a certain way; every student knows that. Nor is it enough, as Darwin has done, to trace analogies between emotions in man and in brutes; for it is not emotion but intellect that is characteristic of man. Most human attributes have their analogues in the lower creation. Indeed it was a favourite idea of the schoolmen, that creatures rose one above the other in a gradual ascending scale. Such a scale has been drawn by Darwin and Haeckel. But the ascent, so gradual to the eye, is broken here and there by vast gulfs of difference. The villages of the Lebanon are so close that you can drop a stone from one to the other, but there is a perpendicular precipice between. There is not much difference to the eye between the lowest man and one of Haeckel's anthropoid apes, nor between a living spore and a speck of dust. But there is a difference so vast that Darwin has been unable to span it. He has not been able to explain the transition from brute matter to life, nor that from a material to a spiritual soul. The finger of God is here.

One might expect that if ever lower animals had a chance of attaining, if not human form, at least human intelligence, it would be in historic times, when they are especially bred and trained and cultivated by man's care. Yet they fall hopelessly short; they get no nearer, except as man may get nearer the stars by going upstairs. Is this because Nature has fallen off in her variability, being no longer young? Then natural selection is not enough for evolution, but we need a certain indwelling potentiality. Whence came this potentiality? The teleologist will call it, with all respect to Mr. Grant Allen, "a creative *nisus*."

Again, man is a free being. Or has Darwin shown that he is not? But how can freewill have grown out of the necessary evolution of matter?

These are some of the doubts of a teleologist touching the Darwinian formularies. They form part of his scientific plea for still holding the old faith to be better than the new. The worship of God the Creator has survived the discovery that the stars are not animals, and that they are not borne about by angels. Our idea of God's majesty has even gained by dropping epicycles and geocentricism. Teleologists will yet "baptize" Darwin, as they baptized Aristotle in the thirteenth century, and classical literature in the sixteenth. They will accept as much evolution as is capable of proof, and glorify God Who planted the germ and primitive potentiality. They will yet, as Kingdon Clifford once dreaded they would, seize all the glories of modern science and weave them into a crown for the Creator and Redeemer of men.

JOSEPH RICKABY.

Supplement to the Flora of Norfolk. By Rev. KIRBY TRIMMER, A.B. London: Jarrold. [1885] pp. vii. 73. 5s. 6d.

Flowers and Ferns of Cromer and its neighbourhood. By B. A. F. PIGOTT. London: Jarrold. [1885] pp. 100. 2s. 6d.

Botany. By HERBERT D. GELDART. Reprinted from Mason's 'History of Norfolk.' [1884] 4to, pp. 14.

THE most noteworthy feature of Mr. Kirby Trimmer's book (apart from its very high price) is his arrangement, with descriptions, of the Norfolk mints. Norfolk has been rendered the classical county for menthologists by Smith and Sole, and Mr. Trimmer has evidently very carefully studied these interesting but puzzling plants, inasmuch as he speaks of his collection as containing about a hundred and fifty specimens of *M. hirsuta* alone. These he groups under six "forms," designated by the Greek letters, each being carefully described. He mentions a plant of *M. alopecuroides* which, "when gathered, measured 4 ft. 3½ in. in height." The Mints occupy thirteen pages—more than one-sixth of the whole work; and the care which Mr. Trimmer has bestowed on them makes us regret that other genera have not received a share of his attention. An interesting note on a habitat of *Spiranthes autumnalis* is worth quoting:—"In the autumn of 1869 I met with this plant in St. Mary's Island, Scilly, growing abundantly in a very remarkable situation, namely, in the crevices and on the top of the rampant-wall [rampart-wall ?] of the garrison at Heugh Town."

Mr. Pigott's "little book does not profess to be a book of scientific botany, or even a complete list of all the plants to be found in the neighbourhood of Cromer." This is just as well, for it certainly has no claims to be so regarded. It is in the usual style of popular books about wild flowers—full of poetry (not always correctly cited) and moralisings and (mostly second-hand) quotations from old books, with a dash of Mr. Grant Allen, whose method of "accounting for" the colours of flowers and the forms of leaves seems to be accepted by Mr. Pigott with implicit confidence. Some of the Latin (or as the author styles them "generic") names, which are relegated to the margin, are somewhat unfamiliar to our eyes—such as *Saxifraga muralis* (the English synonym of which, "the Nine-leaved Saxifrage," is also strange to us) and *Rumex diœcious.*

Mr. Geldart's paper is an enumeration, without localities, of the plants of the county, so far as known up to the summer of 1883, prefaced by a short but interesting introduction. The Mosses, Hepatics, Lichens, and Algæ are included, the lists of these being due, wholly or in part, to Miss A. M. Barnard. Each of these is furnished with what it is customary to call an "English name," except the seaweeds, which for some reason escape. It would be interesting to know whether any one in real life ever spoke of the "blunt pear-shaped beardless moss" or the "scurfy imbricated parmelia" or the "papillary pycnothelia;" and it would be further of interest to know whether such names are considered by any sane person to be easier to speak and to remember than the scientific titles.

Epping Forest. By EDWARD NORTH BUXTON, Verderer. London: Stanford. Ed. ii. 8vo, pp. xii. 139. 2s.

Walks in Epping Forest. Edited by PERCY LINDLEY. London: 123–125, Fleet Street. Long 8vo, pp. 117. 6d.

THE value of Epping Forest as a hunting-ground for London naturalists, coupled with its recent preservation to the public and its careful exploration by the Essex Field Club, have all tended to make it one of the most popular of London resorts; and to this popularity we owe the two handbooks named above.

Mr. E. N. Buxton's is the more generally useful of the two, and has systematic lists of the Fauna and Flora—the former exquisitely illustrated, the latter more especially concerning us. This owes its value chiefly to Mr. G. S. Boulger, recently president of the Essex Field Club, and the Messrs. Ware, of Tottenham, so far as the phanerogams are concerned; there are also lists of the fungi and mosses, mainly the work of Mr. James English. The sentence preceding the list of fungi is a little puzzling:—"The real plant proper, or Mycelium, dives underground, and may live for years in that condition without producing its fungi, which are analogous to the flower or fruit of a plant." As Mr. Buxton is

Chairman of the London School Board, we may also suggest the desirability of his revising the spelling of the names of the fungi, many of which stand much in need of such attention: *e. g.*, "saponaceous," "purpuracens," "aboviolescens," "cennabarinus," and the like. No fewer than twenty "routes" for exploring the Forest are laid down, and there are excellent maps.

Mr. Percy Lindley's little book is less suited to the naturalist than Mr. Buxton's, to which Mr. Lindley acknowledges his indebtedness, but will be found quite sufficient for most ramblers. The small portion devoted to plants is not the most satisfactory part of the book. There are many illustrations, and its cheapness is remarkable.

Flowering Plants and Ferns of the Riviera and neighbouring Mountains. Drawn and described by C. Bicknell. London: Trübner, 1885. 82 coloured plates with text. £3 3s. 0d.

This handsome book is the outcome of a recommendation by Mr. Moggridge in his 'Contributions to the Flora of Mentone,' that others should "follow his example and publish for the benefit and pleasure of the constantly-increasing winter residents in the Riviera" drawings of the plants of the district. Although hardly on a level scientifically with Mr. Moggridge's book, Mr. Bicknell's drawings evidence careful study and conscientious work, and the volume is thus distinctly in advance of most of its class. Two or three species are figured in each plate, and are accompanied with brief but sufficient botanical diagnoses. All have been collected by the author, who has made a collection of some eleven hundred drawings, and is "hoping to prepare a second series should this first one be found to meet a want." How this may be we cannot venture to prophesy. The book is an expensive one; but there must be many who will gladly add it to their libraries. The colour-printing is fairly good, but might be better; it is not up to the level, for example, of some of the plates given weekly in the 'Garden.'* The descriptions have always been "carefully verified from living specimens." The modest tone in which Mr. Bicknell writes, as well as the evidences of care taken both in drawing and description, induce us to wish well to this handsome volume.

New Books.—L. Fourquignon, 'Les Champignons Supérieurs' Paris, Doin, "1886": 8vo. pp. iii. 231, 105 cuts). — F. von Thumen, 'Die Bekämpfung der Pilzkrankheiten' Vienna, Faesy, "1886": 8vo, pp. x. 160).—H. Schenck, 'Die Biologie der Wassergewachse' Bonn, Cohen, "1886": 8vo, pp. iv. 162, tt. 2), 'Handbuch des Getreidebanes' (Bonn, Strauss: 8vo.). — F. Kornicke, 'Die Arten und Variatäten des Getreides,' pp. x. 470, tt. 10: vol. ii. (by H. Werner), 'Die Sorten und der Auban des Getreides,' pp.

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* We say "some," because while many of them are excellent others are unsatisfactory.

1010).—A. List, 'Uber die in und auf dem Körper des gesunden Schafes vorkommenden neideren Pilze' (Leipzig, List; 4to, pp. 62, tt. 4).—L. Glaser, 'Taschenwörterbuch für Botaniker' (Leipzig, Weigel: 8vo, pp. viii. 486: 5 mark.)—E. Wollny, 'Saat und Pilze der landwirthschaftlchen Kulturpflanzen' (Berlin, Parey: 8vo, pp. xvi.-833: 38 cuts). — R. Hartig, 'Das Holz der deutschen Nadelwaldbäume' (Berlin, Springer: 8vo, pp. vii. 147: 6 cuts).— K. Richter, 'Die Botanische Systematik' (Fasey, Vienna: 8vo, pp. 174.—H. R. Göppert, 'Der Hausschwamm' (Müller, Breslau: 8vo, pp. vi. 56, tt. 4). — F. Debray, 'Étude Comparative des caractères anatomiques et du parcours des faisceaux fibro-vasculaires des Pipéracées' (Doin, Paris, "1886": 8vo, pp. 107, tt. 16). — C. Noeldeke, 'Flora Goettingensis' (Celle, Spangenberg, "1886": 8vo, pp. x. 126). — M. Fuchs, 'Die geographische Verbreitung des Kaffeebaumes' (Leipzig, Veit, "1886": pp. ii. 72). — J. Moeller, 'Mikroskopie der Nahrungs-und Genussmittel aus dem Pflanzenreiche' (Berlin, Springer, "1886": 8vo, pp. vi. 394, 308 cuts). — H. Reiter, 'Die Consolidation der Physiognomik' (Graz, Lenschner: 8vo, pp. vi. 258).—L. H. Grindon, 'Fruits and Fruit-trees' (Manchester, Palmer & Howe: 8vo, pp. vii. 320, 6*s*.).

Articles in Journals.

Botanical Gazette (Nov.).—L. H. Bailey, 'Notes on *Carex*.'

Bot. Centralblatt (Nos. 44–47). — A. Mahlert, 'Beiträge zur Kenntniss der Anatomie der Laubblätter der Coniferen.'

Bot. Zeitung (Oct. 23, 30).—A. Kleeberg, 'Die Markstrallen der Coniferen' (1 plate).

Botaniska Notiser (Heft 5). — L. M. Neuman, 'Botaniska anteckningar från en resa i södra och mellersta Norrland år 1885' (*Rumex armoraciæfolius*, sp. n.). — K. F. Thedenius, '*Tragopogon parvifolia-minor*, en ny hybrid.' — N. J. Schentz, 'Spridda växtgeografiska bidrag.'

Bull. Torrey Bot. Club (Sept. & Oct.). — J. Redfield, 'Further Notes on *Corema*.' — L. P. Gratacap, 'Botany of the Aztecs.' — D. F. Day, Obituary of George William Clinton (April 13, 1807—Sept. 7, 1885).

Flora (Oct. 11, 21, Nov. 1).—A. Kramer, 'Der Entwickelungsgeschichte und der anatomischen Baues der Fruchblätter der Cupressineen und der Placenten der Abietineen' (1 plate). — J. Müller, 'Lichenologische Beiträge.'—(Oct. 21). H. G. Reichenbach, 'Comoren-Orchideen Herrn Léon Humblots' (*Habenaria Humblotii*, *H. tomentella*, *Cynosorchis galeata*, *Etæria vaginalis*, *Cheirostylis Humblotii*, *Platylepis polyadenia*, *Saccolobium Humblotii*, *Angræcum xylopus*, *A. culiciferum*, *Aeranthus phalanophorus*, *A. arachnanthus*, *A. gladiator*, *A. comorensis*, *A. trifurcus*, *A. meirax*, *Grammangis pardalina*, *G. falcigera*, *Eulophia cordylinophylla*, *E. lonchophylla*, *E. sclerophylla*, *E. alismatophylla*, *Liparis polycardia*, *Microstylis cardiophylla*, spp. nn. — (Nov. 11). — Röll, 'Zur Systematik der Torfmoose.'

Gardeners' Chronicle (Oct. 31). — *Mormodes Dayanum* Rchb. f., n. sp.; *Catasetum glaucoglossum* Rchb. f., "n. typ."—J. D. Hooker, '*Torreya californica*' (fig. 125). — *Abies grandis* (figs. 128–131).—W. G. Smith, 'Diseases in Fruit; *Aspergillus glaucus* and *Eurotium herbariorum*' (figs. 132, 133). — (Nov. 7). T. Moore, '*Dicksonia Lathamii*, n. hyb.' — *Athrotaxis laxifolia* (fig. 134). — *Combretum micropetalum* (fig. 137). — G. S. Jenman, 'Proliferation in Ferns.' —(Nov. 14). *Brassia elegantula* Rchb. f., n. sp.—*Helenium autumnale* with stalked florets (fig. 142). — *Aerides Vandarum* (fig. 143). — (Nov. 21), *Aerides Bernhardianum* Rchb. f., *Oncidium Hübschii* Rchb. f., *Anthurium flavidum* N. E. Br., spp. nn. — *Abies nobilis* (figs. 146–148).

Magyar Növénytani Lapok (Sept., Oct.).—Obituary of E. Boissier. — J. Csató, 'Adatok a *Juniperus Sabina*-nak hazanklan való elter jedéseliéz.'

Oesterr. Bot. Zeitschrift (Nov.). — F. Krasser, 'Zellkern der Hefezellen.'—L. Celakovsky, '*Alisma arcuatum*.'—M. v. Sardagna, 'Zur Flora von Sardinien.'

OBITUARY.

Benedict Roezl died at Smichor, Prague, on October 14th last, from a long biliary fever, in his 61st year. He was very well regarded in horticultural circles as an earnest collector of living plants, especially Orchids, and as the uncle of the brothers Klaboch, one of whom, Edward, is still collecting with success, when the other died a martyr of horticulture. Roezl has discovered numerous plants, as the *Dalechampia Roezlii*, *Bollea cœlestis*, *Masdevallia Chimæra*, *Roezlii*, *Livingstoniana*, and many others. He travelled in the Southern United States, in Mexico, Ecuador, New Granada, and Venezuela. Nobody would have expected the early death of so strong a man, though it is well known the loss of a limb helps to shorten life; and Roezl had lost his left arm, which loss made him give up farming and collect plants.—H. G. Reichenbach.

Baron Franz Ungern Sternberg, the monographer of Salicornaiads, died at Turin on August 12th, having suffered a very long time, and at last continually for nine months, from malaria fever. He was a medical man, and had held a government position at Tenda, in the Alpes Maritimes, for some time, as long as he could stand it, as Tenda, such a sweet place for botanists, affords indeed very little higher comfort to an educated man. Thus he was an authority for the environs of Tenda. He was an especial pupil of Bunge, who regarded him very highly. Many botanic tourists have enjoyed his kind assistance when at Tenda, so that I am sure the news of his death will also be much regretted by several readers of this Journal.—H. G. Reichenbach.

Sir Joseph D. Hooker has resigned his post as Director of the Royal Gardens, Kew.

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CORRIGENDA,

Page 46 *dele* first 5 lines.
124 line 13 from top, *for* "1875" *read* "1885"
,, 20 ,, *for* "faces" *read* "facies"
172 7 ,, *for* "Moore" *read* "Moon"
175 17 from bottom, *for* "Thorm." *read* "Thonn."
191 2 from top, *for* "N. G. Brown" *read* "N. E. Brown"
196 13 ,, *for* "Scues" *read* "Screes"
204 3 ,, *for* "Tampalé" *read* "Tumpalé"
,, 14 from bottom, *for* "THOREA" *read* "SHOREA"
206 26 from top, *for* "3815" *read* "3885"
207 8 ,, *for* "covered" *read* "crowned"
208 14 ,, *for* "deepened" *read* "depressed"
,, 22 ,, *after* "conical" *insert* "projection"
,, 36 ,, *for* "Leman" *read* "Seman"
227 4 from bottom, *for* "it" *read* "I"
241 9 from top, *for* "spores" *read* "spurs"
242 1 and line 10 from top, *for* "Uakgalensis" and "Uakgala" *read* "Hakgalensis" and "Hakgala"
,, line 1, *for* "(EPISTYLIS)" *read* "(EPISTYLIUM)"
244 5 from top, *for* "Kakgala" *read* "Hakgala"
266 10 from bottom, *for* "bract" *read* "boat"
267 27 from top, *for* "bulk" *read* "bulb"
268 21 ,, *for* "nivalis" *read* "rivalis"
270 17 ,, *for* "or" *read* "on"
271 last line, "(in pt.)" *read* "(mpt.)"
272 line 7 from bottom, *for* "Trim.," *read* "Trin."
273 14 *dele* ";" after "subpersistent"
,, 36 *for* "Rama" *read* "Rana"
310 4 from bottom, *for* "Clava" *read* "Clova"
349 12 ,, *for* "styles" *read* "stoles"

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